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# BEFORE AND AFTER SURGICAL OPERATIONS.

A TREATISE ON THE PREPARATIONS FOR, AND THE  
CARE OF THE PATIENT AFTER OPERATIONS,  
INCLUDING HOMŒOPATHIC  
THERAPEUTICS.

Written With Special Reference to the Needs of the General  
Practitioner and the Hospital Intern.

BY

DEAN T. SMITH, B. Sc., M. D.,

PROFESSOR OF SURGERY AND CLINICAL SURGERY, UNIVERSITY OF MICHIGAN,  
HOMŒOPATHIC DEPARTMENT, ANN ARBOR.

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## PREFACE.

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EVERY general practitioner is called upon, at times, to prepare for an operation in a private home and to have the care of the case after the operation is performed. In writing this book, I have had just this situation constantly in mind.

The directions for treating post-operative complications as given in our books on general and operative surgery, and as taught in most of our colleges, are so meagre and scattered, it seems to me there is need of a special book on this subject, one that enters into the minute details of the after-care of surgical cases. This need has been emphasized to me by a large experience, operating in private homes for physicians, whose lack of experience in caring for surgical cases, made detailed instructions necessary.

It is hoped the hospital intern, whose college training in this special field was deficient, will find in these pages directions that will help him in times of emergency.

Next to aseptic methods in operations, proper nursing has contributed more than any one factor to the success of modern surgery. While this book is written primarily for the physician, it describes much in detail that the nurse will have to do for the patient.

It should be helpful to her in the care of surgical cases.

Simple home or "make-shift," but practical, methods have been described as well as those requiring special apparatus.

Homœopathic therapeutics has been made a prominent feature in the book. At the same time, no repertory has been used to find unusual remedies or symptoms. For the most part, the drugs, with the indications and potencies given, are such as I have used with success in my own practice. All the drugs "indicated" could not be listed, and doubtless some readers will be disappointed because they do not find their "favorite remedy" or "indication." The therapeutics in such a book as this must necessarily be more suggestive than comprehensive.

Professor R. S. Copeland has written the chapter on the care of eye, ear, nose and throat cases. Dr. Copeland's recognized ability will make this chapter valued by all who know him.

Myrta M. Woodson, principal of the Training School for Nurses, University of Michigan Hospital, Homœopathic, has written the chapter on "Dietetics." The chapter is full of suggestions that will help the physician or nurse in selecting and preparing the right food for the patient.

To these and others who have assisted and encouraged my work, I wish to express my gratitude.

DEAN T. SMITH.

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# BEFORE AND AFTER SURGICAL OPERATIONS.

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## CHAPTER I.

### PREPARATIONS FOR A SURGICAL OPERATION.

This chapter is intended especially as a guide for the care of surgical cases in private homes. There are certain objects to be obtained in the preparation for an operation that are recognized as essential by practically all surgeons. These we will discuss.

**The Patient.**—The general condition of the patient, as well as the part to be operated on, will have to be considered. The circulation should be free from any serious abnormality either in volume or rapidity; the respiration, unobstructed; the excretion of urea, not much below normal; the alimentary canal, clear of fecal accumulations; the field of operation, clean and sterile. In regard to these conditions, there is no one standard to which all patients are expected to be brought. Each patient will have to be his own standard. We would not expect to secure the same condition of the pulse in a patient suffering with acute suppurative appendicitis as in a chronic case operated on between attacks. We would not expect a patient who is to be operated on for a large ovarian cyst, pressing on the diaphragm, to have as easy respiration as the patient being operated for a chronic pyo-

salpinx. Assuming that the patient is operable, he should be gotten into the best condition possible for him, along the lines mentioned. In accident cases, and sometimes in other emergencies, there is no time for special preparation; the risk of waiting is greater than the risk of operating without previous preparation.

The best interest of the patient is the guide in all cases. If the condition for which the patient is operated is chronic or slow in developing, and as much time as is desired can be used in getting him ready, different details will be used than when, for any reason, the preparation has to be hastened.

If the patient, in any particular, falls below the standard that we feel he should reach, the giving of the properly selected homœopathic remedy will be a most important part of the treatment necessary to correct the defect. I cannot believe that a weak, tired heart can be prepared to withstand the strain of a serious operation by the use of stimulating drugs. The drug condition may give the semblance of tone and vigor to the heart, but, it seems to me, the tone and vigor must be at the expense of the real vitality of the organ. Stimulating drugs are like a bellows, fanning the flame into a fiercer burning. If there is plenty of fuel, well and good. If not, it will but the sooner exhaust the supply. The bellows has its place, so has the heart stimulant. If the fire has nearly gone out, with the bellows it may be kept burning until a new supply of fuel is secured. So the heart, suffering from shock, may, by the use of the stimulant, be kept from stopping its beating until

the operation is over and reaction brings a new supply of natural energy.

Many eminent and successful surgeons are in the habit of giving all of their weak patients a hypodermic of 1-60 to 1-30 of a grain of *Strychnia* a short time before an operation. I have not followed this method. The patients who are weak and exhausted by long suffering, the kind that we would naturally think it necessary to stimulate before an operation, are not the cases most likely to give trouble. The strong man, who has not been inured to suffering, is much more liable to feel the shock; to have difficulty with his respiration or heart. The former patient will often go through a most serious operation, and the next day be as bright and chipper as though nothing unusual had happened. Not so the other.

If the circulation or respiration is too weak for the operation, the patient should be put to bed; the food carefully selected; the excretions regulated by enemata assisted by the appropriate remedy. The effort should be to bring new vitality, new fuel, to the heart that it may be built up and strengthened for its ordeal. I will not attempt to even give a list of the remedies that may be needed in these cases. The conditions causing these weaknesses, and the grouping of symptoms that attend them, are so varied that each case will have to be studied by itself.

The routine practice, when the heart is weak, is to give, for a short time before the operation, *Strychnia* in 1-60 to 1-30 grain doses; *Digitalis*, tinct., three to ten drops, or the infusion of *Digitalis*, one-half to one teaspoonful; *Strophanthus*, tinct., three to ten

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drops, or some other heart stimulant. These remedies are usually repeated once in two to six hours, according to the condition of the patient and the effect sought. To my mind, a more rational stimulant, and one recommended by some prominent surgeons, is normal salt infusion. The infusion, or rather injection, of the solution into the loose cellular tissues may be begun twelve to twenty-four hours before the operation and continued as necessary to sustain the circulation. When the heart is weakened by surgical shock it is usually the direct result of lowered blood pressure. The infusions would supply mechanically the needed fluid for such cases. There will be little danger, if any, of the *salt solution* causing an increase of the hæmorrhage during the operation. Experiments have shown that the salt does not interfere with the coagulation of the blood; and that the blood pressure, because of the rapid escape of the fluid from the vessels, cannot be raised above normal, even when the infusion is directly into a vein. (MUMMERY.)

Organic lesions of the heart are not now considered contraindications for anæsthesia so long as the compensatory hypertrophy sustains the circulation. Hasler claims that no lesion of the heart is a contraindication for an anæsthetic, if administered by a skilled anæsthetist. The proposition may be true. However, few surgeons will feel warranted in operating if the heart be weak and dilated as the result of valvular lesions, unless the condition for which the operation is to be made threatens the life of the patient.

Edebohls has shown, by operating on cases of

chronic Bright's disease, that the condition of the urine is not so important as an indication for or against anæsthesia as we had supposed. The urea, in patients preparing for an operation, is nearly always below the normal amount for a healthy person. The lessened exercise and the restricted diet accounts for this condition. If the amount of urea is less than twelve gms. in twenty-four hours efforts should be made to increase the excretion, unless the condition of the patient demands immediate operation. *Apis mel.* 2x, repeated every hour or two, will, in most cases, give a satisfactory result in four or five days. Infusion of *Digitalis* in one-half to one teaspoonful doses, repeated once in four to six hours, will be effective in some cases. Other remedies will be frequently indicated.

In the preparation of the alimentary canal, the details will depend largely on the time that can be spent before the operation. If the preparation continues a week or more, it may not be necessary to give any cathartic. The diet can be regulated so that there will be but little detritus in the bowels. If the bowels move freely every day, an enema or two given before the operation would be regarded as sufficient preparation by many surgeons. Most surgeons prefer to give a laxative one or two days before operation, so as to be sure that all fecal accumulations are removed from the intestines. It is thought that such accumulations lead to the development and absorption of ptomaines, and thus produce auto-infection. I have watched with considerable interest the results in emergency cases, when no preparation of the ali-



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mentary canal was possible, and I do not remember ever seeing a case that I thought had done badly because the bowels had not been scrubbed out. This is not intended as an argument against special preparation of the patient. However, I do not feel as much anxiety as I used to when I have to operate on a patient who has had no preparation.

**Menstruation.**—The time and character of the menstruation is an important factor in planning for an operation on a woman. If the patient is exhausted after the catamenia, either because of severe pain or from excessive flow, the operation should be planned for the middle of the month or a little later. I prefer to have an interval of a week between the operation and the time for the next period. An operation often hastens the appearance of the flow, and, other things being equal, it is better for the patient to be recovered from the shock before menstruation comes on.

The excitement incident to the preparation for an operation will often precipitate the flow. If the condition for which the surgery is to be done will not safely admit of delay, I pay no attention to the menstruation. If the flow is abnormal, and presents features that will make immediate operation more dangerous than the delay, the operation should be put off.

If there is no special need for haste I do not operate while a patient is flowing. There is more or less disturbance of the system at this time, and it would increase any danger that might attend the surgical work. As a rule it is better to operate as menstruation is stopping than when it is just beginning. The fright and excitement may suppress the flow and cause

severe nervous trouble. However, if the patient is in the habit of having severe headache or other marked neurasthenic symptoms at the close of menstruation, and cannot wait until she is fully recovered, it may be best to operate at the beginning. Much will depend on the vitality of the woman and the character of the flow.

I have not known of any case that did badly because the operation was made during the menstrual period.

**Diet.**—When practical, the dieting should begin a week before the operation. According to Dr. Kellogg, only vegetable foods should be taken during this period. He is an Adventist. Dr. Le Seure would leave out all or nearly all vegetable foods, keeping the patient on a meat diet. The object of each is to avoid fermentation and to have as little detritus as possible in the intestines. The food should be nutritious and easily digested. Coarse vegetables and foods with excess of starches and fat meats should not be taken. The day before the operation the patient should take only soft diet. (p. 91.) No food should be taken into the stomach for eight or twelve hours before the anæsthetic is given. A cup of coffee may be taken two or three hours before and as much water as the patient desires. It is a good plan for the patient to take a cup of water five or ten minutes before taking the anæsthetic.

Most surgeons prefer to have the preparation of the field of operation begun twenty-four to forty-eight hours before the work is done. This preparation consists in scrubbing the part with soap suds; shaving and putting on a green soap poultice, to be followed

after three or four hours by a moist antiseptic pad of gauze. If the preparation is begun two days before the operation, a plan followed by but very few surgeons, the scrubbing should be repeated and a fresh pad put on at the end of the first twenty-four hours. *Bichloride of Mercury*, 1 to 4,000, is the antiseptic usually employed. Some surgeons use the solution in 1 to 2,000 strength. This strength will sometimes cause a dermatitis in patients with a sensitive skin.

Some surgeons prefer, when the patient is exceedingly sensitive and nervous, to have all local preparation postponed until the anæsthetic has been given. They claim that the effect of the preparation on the nervous system will do more harm than will be neutralized by the destruction of a few more germs in the skin. With proper tact and gentleness the nurse can usually overcome the patient's fear so that the usual routine can be carried out.

The portion of skin cleaned and sterilized should be much larger than just the part to be cut through. It often happens that the incision has to be extended beyond the expected limits. Besides this, it is often impossible for the surgeon and his assistants to keep their hands and instruments from coming into contact with the surrounding skin. Another caution, if there is an abscess, or cyst of any kind present, it should be handled very gently, lest it be ruptured during the preparation of the patient.

These directions will be applicable to any important operative case, whether the trouble be in the abdomen or on an extremity. There may be a few exceptions to these rules. *Bichloride* packing should

not be used in contact with mucous surfaces, as the vagina. *Creoline* or *Iodoform* gauze may be substituted. If skin grafting is to be the operation no strong antiseptic should be used. *Normal salt* should replace the antiseptic on the gauze pack.

**The Operating Room.**—The room in which the operation is to be done should be well lighted and capable of being made clean. The kitchen or dining room is usually the most suitable. When the kitchen is large enough and has good light it can easily be made into a good operating room. There is usually little or no drapery to remove, and the walls and floor can be scrubbed. The hot water will be handy and the stove will furnish the needed warmth.

If the dining room has a carpet, it will present no advantages over any other room of sufficient size that has a good light. For a major operation, all drapery and pictures should be removed from the room and the carpet taken up. Floors should be scrubbed and walls wiped down with a moist cloth. If there is not time for such complete arrangements, clean sheets may be pinned to the carpet and on the wall about the operating table. The object of the sheets is to prevent any dust that might contain germs dropping on to the instruments, dressings or patient. There should be a nail or hook about seven feet from the floor on which a fountain syringe can be hung.

The operating table should be narrow. A kitchen table lengthened out by a stand of suitable height will answer the purpose nicely. An excellent operating table can be made by taking two leaves out of an extension table and putting them lengthwise on

the table across the open space. The patient is laid on these leaves so that the field of operation is over this space. This will give a narrow table where it is needed and the operator and his assistant can both be close to the patient.

The table should be wiped off with a *Bichloride* solution, 1 to 2,000, and covered with a clean sheet. Two stands should be provided; one for the dressing, the other for the instruments and hand lotion. These should be wiped with the *Bichloride* and covered with sterile cloths or towels. The nurse should provide one dozen to three dozen towels or cloths. There should also be plenty of gauze and cotton. All of these things should be sterilized.

If the doctor has a sterilizer the preparation of the dressing will be a simple matter; if not, the cotton, gauze and cloths may be done up in packages, wrapt in paper and baked in the oven. This method is rather uncertain. If the packages are made hot enough to destroy the germs they are liable to be scorched.

Another method is to put a false bottom in a boiler. It may be made of light strips of wood and should be about six inches from the bottom. It may be supported by pieces of wood. Three or four inches of water should be put in the boiler and the articles to be sterilized, pinned in towels, are placed on the false bottom. The boiler cover should fit fairly snugly. When the water has boiled an hour the cover may be taken off for a few minutes to allow the dressings to partially dry. This method will secure perfect sterilization.

#### PREPARATIONS FOR A SURGICAL OPERATION. 27

Three or four basins or wash bowls, a pitcher and a dipper should be put into a boiler the night before the operation and two or three pails of water added and boiled. This boiler should be set aside and not uncovered until it is to be used in the operating room. This will give us cooled sterilized water as well as sterilized basins.

*Normal salt* solution will be needed if an abdominal operation is to be performed. This is prepared by boiling a saturated solution of salt. A teaspoonful of this solution to a pint of water will give the required strength.



## CHAPTER II.

### FIRST CARE AFTER OPERATION.

A study of this subject will naturally begin with a consideration of those conditions that may arise after any surgical operation. The endeavor will be to make the instruction minute enough as to details, and comprehensive enough as to subjects to cover the simple as well as the complicated cases.

**Room.**—The after-care of surgical cases will begin when the patient leaves the operating room. Hence, the care begins with the selection and preparation of the room and bed to which the patient is to be brought. A suitable room will add much to his comfort and well being. Of prime importance is the question of ventilation. It should be possible to change the air in the room without causing currents that will strike the patient. If the building lacks special ventilating arrangements, there should be an outside room connected with the patient's room by a door. The air of this room can be changed, and, when warmed, the door between the rooms opened. Thus fresh warm air can be brought into the sick-room. Of course, the air in the room should be fresh to begin with. In order that it keep so, people should not be allowed to remain in the room before the patient is brought in. After he is in the room only those should be allowed to remain who are required to care for him.

A room should be chosen that can be kept evenly heated. No oil or gas stove should be used. Any stove that throws off the products of combustion into the room will soon exhaust the oxygen and fill the air with poisonous gases. This proposition is so reasonable to anyone who understands anything about the principles of combustion that it almost seems superfluous to mention it. And yet, I have, at times, had to exceed the limits of courteous argument, and insisted that a patient must have a room that could be heated by an ordinary stove or furnace. The fact that the "room is so comfortable" seems, to many, all sufficient.

**Bed.**—The first essential of the bed is that it be clean. The tick or mattress need not be new, but it should be free from dust and reasonably clean. The linen should be freshly laundered. A narrow iron bed is most convenient, but not essential. A hair mattress is the best; a husk mattress with a cotton top will do. A feather tick is a nuisance on a sick-bed. Still there are some people who have slept on nothing else for so long a time they are in distress if they do not have the feathers. Sometimes, not always, it is best to humor them. The feathers will do less harm than the worry and imaginary or real distress.

The bed should be warm. It is doubtful if any person can take an anæsthetic without lowering of his vitality. And even a simple operation may sometimes be attended by considerable shock. When possible, the hot water bottles, hot irons, or whatever is used to heat the bed, should be put between the sheets some time before the patient is brought in.

Then the bed will be heated through, and will not be cold as soon as the coverlets are raised.

**The Patient.**—We have our patient tucked snugly in the warm bed. His pulse and respiration show that he is doing nicely. He is still asleep from the anæsthetic. Do not try to awaken him. If you do, your patient may find occasion to swear at you as one of my first patients did at me. He had taken an anæsthetic before and been allowed to sleep as long as he would. We were anxious to hear him speak and so aroused him. He said, with a good many emphatic words, that if we had not awakened him he would have suffered two or three hours less pain.

When the patient is awake do not keep plying him with questions. And above all things do not ask him if he is sick to his stomach. If he is sick, you will find it out soon enough. I believe many a person suffers from nausea and vomiting because of the suggestion, they having their attention called to their stomachs. I do not believe, with some, that nausea is generally due to suggestions made before the operation, and that the proper suggestions made at that time will prevent it. But during the general discomfort following the operation, calling attention to the special organ in an expectant way, can, and often does, cause the distress to localize in that particular spot.

**Pain.**—The first complaint that the patient makes is usually because of pain. Sometimes before conscious of what he is saying, he will cry and take on most bitterly. This may happen even when there is so little actual pain the patient will make no complaint when he is fully awake.

One of the first things the physician will have to decide is, should the patient have *Morphine*? *Morphine* disturbs the stomach; stops peristalsis; has a tendency to suppress the urine; makes a coward of the patient. If his pains are once relieved by the drug, he will afterwards magnify his suffering, refuse to sleep, and make life miserable for himself and his attendants. *Morphine is an evil and should always be so regarded.* It is not the only evil to be dealt with after operation. Of two, it may be the lesser.

When should *Morphine* be given? The patient who has been in the habit of taking the drug for pain prior to the operation should have it afterwards if he is suffering and wishes it. This is no time to reform such a habit. After twenty-four or forty-eight hours the physician may try to stop the use of the drug if he wishes. My experience is, that, if the habit is pretty well fixed, and the patient wishes the drug, it is a waste of time and temper to try to reform him. He will be under care but a short time. Nine times out of ten he will secure the drug surreptitiously while the physician thinks he is keeping it from him. As soon as he is free he will take to the drug as though no effort had been made to stop him. And this applies to "her" more often than to "him."

For the patient who has seldom or never taken the drug a different course is advisable. Unless the character of the operation is such that severe pain is sure to follow, give no *Morphine* until the patient is fully conscious and shows that he positively needs it. If the pain is bound to be severe, and the patient is a neurotic, it will be best to give  $\frac{1}{8}$  gr. to  $\frac{1}{4}$  gr. hypo-

dermically after he is awake, but before he is fully conscious. If he is phlegmatic, give no *Morphine* until his suffering makes it necessary.

If in doubt as to whether *Morphine* will be required, try to quiet the patient by proper suggestion; by the use of the hot water bag, or by giving the "indicated" remedy if the condition of the stomach will admit. Prominent among the remedies that affect the nerves, quieting their irritability, are *Chamomilla* 12x, *Hypericum* 3x and *Hyoscine* 3x. Give *Morphine* only when it is evident that the suffering will do the patient more harm than will the drug.

As to the dose: unless the pain is very severe and the patient has not been accustomed to taking the drug,  $\frac{1}{8}$  gr. hypodermically will be sufficient. It is better to give a trifle more than just enough to quiet the patient than to simply stir him up with too small a dose. One-fourth gr. will be enough for any ordinary case unless the patient is a "Morphine fiend."

**Nausea.**—In discussing the treatment of nausea and vomiting, we will begin with preventive treatment. Suggestion has already been spoken of. The next point I would mention is in regard to the position of the patient. After certain operations, it is necessary for the patient to keep in certain positions. These conditions will be discussed in connection with the special operations. Barring such cases, the position or moving about of the patient will depend largely upon the effect on the stomach. Turning upon the side or shifting of position will often cause nausea. Keeping the patient upon the back will sometimes prevent it. Another frequent cause of

vomiting is the giving of water too soon or in too large quantities. Sometimes, after an anæsthetic, the stomach will absorb nothing that is taken into it. The thirst in such cases may be intense. Giving way to the desire to relieve the patient may bring on him still worse distress. If water is given it should be in sips and hot. If this causes vomiting it should be withheld. Water is given earlier and more freely now than formerly. Mummery advocates giving it early and in quantity, not sips, with the idea that, if it is vomited, it will wash out the stomach and give ultimate relief. This course would be best only in selected cases.

As a rule, no solid food should be taken until the stomach is thoroughly settled. There are some exceptions that will be discussed later.

The "sure cures" for nausea and vomiting after an anæsthetic are legion. Most of them are sure cures for some cases, but sure failures for a great many more. I will discuss only those methods that I have tried and that seem to have some virtue in them. Inhalations of *Camphor* have sometimes checked nausea, and at the same time relieved the prostration. Prostration is a part of the *Camphor* picture. Inhalations of vinegar will occasionally check the nausea. A cloth can be moistened with either of these substances and held to the patient's nose. If they do not give relief, they will do no harm and will cause no annoyance to the patient.

Sometimes the sipping of hot water will give relief. At other times, the taking of anything into the stomach seems to aggravate the vomiting and suffering.



When the stomach rejects everything, relief is sometimes secured by giving the patient as much hot water as he can drink, encouraging him to drink it right down, not sip it. When it comes up it will wash out the stomach, and may give temporary relief at least. Some go farther and recommend lavage of the stomach. Lavage will sometimes be effectual, when the mere washing out of the stomach by drinking water and immediately throwing it up does no good.

Improper feeding is often the cause of persistent and distressing nausea. And yet, to know just what to give and what to withhold is, at times, exceedingly difficult. I have known a patient to crave solid food, and his vomiting continued until he got it. Much more frequently have I known patients to bring on persistent and distressing vomiting by taking unseasonable food, when they were sure they wanted it. Unless the patient shows a marked idiosyncrasy in a feeling of repugnance to liquid food, I should give no solid food until he can take water and soft food without vomiting or being nauseated by it.

If the patient likes coffee, it may be given as soon as there is indication that the stomach is becoming settled. In some cases it may be given earlier, even during the nausea. I have seen cases in which it stopped the vomiting. Albumin water (see diet list) is applicable to almost every case and may be given even before the nausea is relieved. It will often have a decidedly beneficial effect. When a patient is suffering from thirst, he should be allowed to sip hot water or albumen water quite freely. As a rule, it

does not protract the stomach disturbance and relieves the mental and physical suffering due to the thirst. This suffering is prostrating to the patient, and should be partially relieved, unless it is evident that the vomiting is increased by the fluids given. They will much more frequently check, than increase, the nausea and vomiting. Lemonade, orangeade, crust coffee, oatmeal water, or some other such preparation may be more palatable and beneficial to your patient than any of the things that have been mentioned.

#### HOMŒOPATHIC THERAPEUTICS.

There can be no difficulty in finding a remedy that presents the symptoms of nausea and vomiting. Nearly all remedies do that. To find a remedy that presents the nausea and vomiting, similar to that from which the patient is suffering, is more difficult. To find a remedy that will cure the condition will be a sufficient cause for self-congratulation. Sometimes the indicated remedy will act like magic. More frequently it will be futile in correcting the trouble.

*Nux vomica* 3x has been more frequently indicated in my cases than any other drug. The symptom, "Bad effect of all kinds of drug mixtures," would cover the cause, at least, of the nausea. The violent retching, often more or less ineffectual; the vomiting of sour mucus; of food and drink; of bile, frequently find their counterpart in the sickness from an anæsthetic. Another indication, perhaps more practical than scientific, is this: "When you do not know what else to give, give *Nux*."

*Ipecac*, 1x or high, is a remedy of which we would

naturally expect much in the treatment of the condition we are considering. I have seldom seen much benefit from its use. Its characteristic is nausea; persistent nausea; distressing nausea; more nausea than vomiting. My observation has been that *Ipecac* acts best in this condition in the first or second potency, or else in some potency above the twelfth.

*Arsenicum album* 3x has these characteristic symptoms: Violent and incessant vomiting excited by eating, or drinking water, especially cold water. Burning pain in the stomach. This remedy has many concomitant symptoms that are seen in patients suffering from an anæsthetic.

There are many other remedies in which nausea and vomiting are prominent symptoms. Any one of them may occasionally relieve the anæsthetic patient.

I wish to give this final admonition. Be careful that you do not make your patient worse by too persistent effort to relieve him. Success will frequently enough attend intelligently applied measures, to warrant a reasonable persistence. But there are some who will vomit after an anæsthetic in spite of "cure alls" and drugs, and every effort to stop the trouble seems only to aggravate it. It will require skill and judgment to know when not to do.

**Shock.**—As has been stated, probably no person takes an anæsthetic without some lowering of the vitality. This lowering of the vitality is not just what is meant by shock. Shock is the lowering of the vital functions due to the impression upon the nervous system, especially the vasomotor centres, made by the operation. The former condition would seldom need

other measures than those already mentioned. The latter will vary in severity from a mere temporary weakness to a prostration from which the patient will die in spite of all that can be done for him.

Shock will be recognized by the following symptoms: Pallor of the skin; the surface cold and clammy; the patient weak and prostrated, every muscle relaxed. There may be delirium, or unconsciousness and coma. The pulse is weak and rapid and the respiration labored.

**Hæmorrhage.**—We take up this topic before discussing the treatment of shock because the two conditions are so much alike in their results that the treatment for both can best be studied together.

*Primary hæmorrhage*, or the hæmorrhage that comes on during the operation, is for the operator to care for and check, and does not really belong to our topic. However, the results of such hæmorrhage, the lowered vascular pressure, is for us to understand and to treat. The lowered vascular pressure in this case is due to the mechanical withdrawal of so much blood that there is not enough in the vessels for them to work with. The effect here is the same as in shock, with this difference: The vasomotor centers are not damaged, as in shock. They are simply handicapped, because there is not blood enough to fill the vessels. It should be borne in mind that the operation in which there would be hæmorrhage would also be apt to have those conditions that would make shock. Hence, in such cases, two factors contribute to lower the blood pressure: the lack of sufficient blood to fill the vessels due to the hæmorrhage, and the paresis

of the vasomotor centres, due to shock. The prognosis is relatively more grave than when either condition occurs alone.

*Intermediary hæmorrhage* comes on within a few hours after the operation. It is a condition that should be recognized as soon as it occurs as it calls for prompt and special treatment. It most frequently follows shock, whether the condition is due to accidental injuries or occurs during operations. During the low blood pressure, incident to the shock, vessels that would ordinarily bleed and be secured do not bleed, and so are overlooked. When reaction, with its increased blood pressure, comes on, these unsecured vessels bleed. In these cases the vessels are apt to be comparatively small, as the larger vessels will have been secured during the operation. Another cause of this kind of hæmorrhage is the insecure tying of vessels. The ligature will control the bleeding while the patient is suffering from shock. With reaction, the increased blood pressure may push the loose ligature off the vessel and hæmorrhage from a good sized artery result.

The diagnostic feature of this condition is "the interval of reaction." With shock, when reaction sets in, it progresses steadily, and when there is a relapse, it is due to some new cause. If the patient, after coming from the operating room, rallies somewhat from the shock, and then without apparent cause the pulse becomes more rapid and weak, the pallor more marked, and the general depression increased, be suspicious of hæmorrhage. If the bleeding is from a surface wound, the blood will show on the dressings

if proper inspection be made. If the hæmorrhage is within a cavity, as the abdominal, or pleural, percussion may show an area of dullness that will help to confirm the diagnosis. One fact should be borne in mind in this connection; most patients who are suffering from shock will have had some form of artificial stimulation before they left the operating room. The apparent reaction may be simply the effect of the stimulant; and the apparent collapse, the return of the patient to the condition of shock after the effect of the drug has worn off.

If the condition of hæmorrhage has been diagnosed, prompt treatment will be called for. If the indications are that the hæmorrhage is from small vessels, a little additional pressure made by dressing and bandages may be sufficient to control it. If the hæmorrhage is not controlled by this means, or if the indications are that the bleeding is from a large vessel, the wound should be opened at once and the vessel secured. If the vessel cannot be tied, iodoform gauze may be packed directly upon and about it and thus the bleeding be stopped. The location of the vessel may be such that after it is caught with an artery forcep a ligature can not be put on. In such a case the forcep can be left in place for twenty-four or thirty-six hours, when the danger of bleeding will be passed. The wound can be protected by packing the dressing about the forcep.

The result of this hæmorrhage will be to still further weaken the patient, to apparently increase the condition of shock. The treatment that is appropriate for shock will be appropriate for these conditions resulting from hæmorrhage.

**Treatment.**—We assume that our patient is tucked snugly in the already thoroughly warmed bed. The treatment will begin by raising the foot of the bed so that gravity will help to increase the blood pressure in the brain. This position may also assist in draining some of the blood from the engorged abdominal veins into the general circulation. The bed may be raised two feet or more. At the same time the patient is made warm by hot blankets, hot bottles, etc. Extreme care will be needed to keep the patient from getting burned if hot bottles are used. The weakened circulation will predispose the tissue to the burning. In his unconscious condition he will not realize the fact that he is being burned. Many a patient has suffered from such burns, even when being cared for by careful nurses. Some surgeons regard this danger so great that they will allow no hot water bags in the bed with the patient.

*Normal salt solution* fills an important place in the treatment of shock. The solution is made by dissolving one drachm (a little more than a level teaspoonful) of salt in a pint of water. The solution should be boiled to make it sterile. This solution, at a temperature of 108° to 112° F, may be injected into the bowel. If the colon tube or a large catheter is used so that the water can be carried up into the sigmoid, a pint or more may be retained. Infusions of the *salt solution* into the subcutaneous tissue (hypodermoclysis) will act more surely and promptly than the injections. These infusions may be made into the axilla, the groin, or beneath the breasts in the female. A sterile fountain syringe, to which is attached a sterile

aspirating needle, will make a very good instrument for this treatment. The skin should be first sterilized by rubbing with alcohol or other antiseptic. The needle should pierce well into the subcutaneous tissue. If the infusion is made under the mammary gland, care should be taken that the needle goes under, not into the gland. The solution in the bag should be at a temperature of  $115^{\circ}$  to  $118^{\circ}$  F. By the time it has passed through the tube it will have sufficiently cooled. A pint to a quart should be infused at a time. The tissues should be gently kneaded while the infusion is being made. The dose should be repeated as often as necessary to sustain the circulation or until the heart ceases to respond to the treatment. The fluid will be absorbed quite quickly and the heart will show its effect by a slower and stronger beat.

Infusion of the *salt solution* into a vein has the advantage that the circulatory organs are affected more quickly. When the shock is very severe, the circulation may be so weak that the fluid in the tissues will not be absorbed rapidly enough to avert the fatal issue. If the solution can be carried directly into the blood-vessels, the patient may be carried over the crisis. In the hands of skilled surgeons, the operation presents few difficulties or dangers. The same can not be said of the man with little surgical experience. For such, my advice would be to first start the subcutaneous injection and have that working while you are getting the vessel exposed and prepared for the direct infusion. The method of making this treatment is as follows: Tie a ligature about the arm just above the elbow tight enough to obstruct the



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flow of blood in the superficial veins. This will make them stand out quite prominently. Then sterilize the part as for any clean operation. An incision an inch and a half or two inches long is made over the vein to be opened. The vein is cleared, and three gut ligatures are passed about the vessel but not tied. If a needle is used it can be thrust into the vessel so that it will be in the grasp of the middle ligature which should now be tied. The needle should point toward the body. If a canula is used in place of the needle, a slight cut should be made in the vessel with a lance so the end of the canula can be slipped into the vein and be in the grasp of the middle ligature, which is tied about it the same as with the needle. The ligature about the arm should now be removed. A funnel with a rubber tube attached may be used in place of the fountain syringe. The greatest danger in this operation is from air getting into the vein, and producing an air embolus. To avoid this accident, the reservoir, whether funnel or bag, should be kept sufficiently filled so that no air can get into the tube. Just before the needle or canula is put into the vessel, the solution should run through it, so that any air that might be in the tube will be washed out. The solution should be from  $105^{\circ}$  to  $110^{\circ}$  F. as it passes into the vein. Unless the tube passes through water sufficiently hot to restore the heat that would be lost as it passes slowly from the receptacle, the fluid in the bag should have a temperature of  $112^{\circ}$  to  $115^{\circ}$  F. The fluid must run slowly into the vessel. When the heart beat shows sufficient improvement the needle is withdrawn, the other ligatures tied and the

vein cut between them. The wound in the skin is to be closed with sutures, adhesive straps or a piece of gauze painted over with colodion. Unless the colodion is used, an antiseptic dressing should be kept on until the wound is healed.

The intracellular infusion is so much safer; so much more easily performed; so free from danger, if proper precautions against sepsis are observed; and withal, so efficient, the ordinary physician or surgeon will seldom have occasion to resort to the intravenous method.

If an *oxygen* tank is available, the patient should be allowed to inhale the gas. It is one of the best restoratives we have, especially when the respirations are shallow and the lungs are not able to absorb sufficient oxygen from the air.

We have, in the divulsing of the sphincter ani, another recourse in the treatment of shock. This maneuver is of so much value that I usually resort to it as soon as there is anything decidedly wrong with either the circulation or respiration during or after the operation. Nor is its efficacy limited to operative conditions. Whenever the vasomotors seem paralyzed, or the lungs need stimulating, divulsing the sphincter is one of our efficient means of bringing about a normal condition. The divulsing may be done with the Pratt rectal speculum, or with the fingers or thumbs. The fingers should slip far enough into the bowel to grasp the internal sphincter. The muscle is to be stretched quite sharply and then relaxed, repeating the dilating about twenty or thirty times a minute.

Among the drugs, *Strychnia* easily leads in popularity in the treatment of shock. The writer in the *American Text-Book of Surgery* sounds this warning: "The vasomotor centers being exhausted, vasomotor stimulants, such as *Strychnine*, are contraindicated, since this would 'lash the tired horse.'" But a little further on in the same chapter he says: "*Strychnia*, in doses of 1-30 grain, repeated every half hour until four doses have been given, and afterwards at intervals of four hours, is most valuable in maintaining cardiac energy. It should be used in connection with the diffusible stimulants. *Nitroglycerin*, in doses of 1-50 grain, may be given with the *Strychnia*." I do not know that we can tell when the vasomotor centers are exhausted, but I do know that some cases do not respond at all to the *Strychnia*. It may be for the reason given. There is no doubt that *Strychnia* has been abused. The custom of giving it for almost every condition calling for tonic or stimulating treatment leads to its use when some other remedy is indicated. In shock or low vascular pressure due to other causes than a flagging heart, *Strychnia* and other heart stimulants must take a second place in usefulness to normal salt infusion.

I have seldom given *Strychnia* in larger doses than 1-60 of a grain. It has seemed to me that this dose, repeated every half hour, is more beneficial than the larger doses. I do not remember having seen a patient improve with 1-30 of a grain, when he had failed to respond to the smaller dose. Howard Kelley advocates pushing the drug in desperate cases, until some muscular twitching shows the physiological action of the drug.

Other drugs are used, but without very definite indications except that they are to take the place of *Strychnia* when, for any reason, it can be no longer given. *Nitro-glycerine*, in 1-150 to 1-50 grain doses, is regarded as next in importance. It acts more quickly, but its effect is of shorter duration. *Digitalin* is also prepared for hypodermic use in 1-60 to 1-100 grain tablets. *Brandy* is often used and seems to temporarily increase the blood pressure. *Adrenalin* promises, from recent experiments on animals, to be a most valuable aid in overcoming shock. Its exact place and best method of use have not been worked out as yet.

#### HOMŒOPATHIC THERAPEUTICS.

Homœopathic remedies are not often depended on in these cases. The indications here are for powerful stimulants to carry the patient over a crisis. The flagging system has to be lashed to keep it going until reaction is established and a natural stimulant is forthcoming. It is wisdom to "lash a tired horse" if he is going to stop within a few feet of the top of the hill, while it might be folly to lash the same horse at the bottom of the hill. However, the use of the carefully selected homœopathic remedy, during this period of collapse and after reaction is established, will greatly hasten the patient's recovery.

There are two remedies that conform quite closely to the picture of shock in their symptomatology. They are *Camphor* and *Veratrum album*.

*Camphor* 3x.—This household remedy for syncope is accorded an important place in the treatment of

collapse. It has the sudden prostration with rapid feeble pulse; coldness of surface, which is blue and cyanotic; cold, clammy sweat.

*Veratrum album* 1x.—*Veratrum* has the same general picture as *Camphor*. The sudden prostration; feeble pulse; coldness of the surface, and sweat are here. If the cold sweat be more on the forehead it indicates *Veratrum*. This remedy has more abdominal pains with vomiting and diarrhœa. Another symptom: notwithstanding the patient has the cold clammy surface he feels as though he were burning up inside.

*Carbo vegetabilis* 3x.—*Carbo veg.* has this same picture of collapse, possibly with the symptoms intensified. Its symptoms are less rapid in developing, but the prostration is more profound. The study of this remedy in collapse has been principally in the treatment of cholera or severe fevers. Its prostration seems to be due to the loss of blood or excessive diarrhœa. It has a place in the treatment of surgical cases.

*Cinchona* 1x.—This is not a drug for the shock so much as for the results of hæmorrhage. It is a genuine tonic for the system when it has been weakened by loss of blood or other vital fluids. It is not called for in severe shock. Its place is in the treatment of the less severe cases when the weakness is due to hæmorrhage, or, in the severe cases after there has been some reaction. Its action is not to stimulate but to build up. It has a few characteristic symptoms that will be met frequently in these cases. Distention of the abdomen with gas, which is unrelieved

by eructations; exhausting diarrhoea; profuse sweats; sense of soreness of the body, even of the skin.

*Arnica* 3x.—*Arnica* is a surgical remedy, but is probably more frequently called for after injuries and traumatism than after operations. Operations frequently follow traumatisms, and the thing most needing treatment may be the sequella of the traumatisms rather than of the operation. The usual symptoms for which this remedy is given are: a sensation as though the muscles had been bruised and pounded; tendency to ecchymoses; bed seems so hard it bruises the muscles. If the brain has been contused, we may have unconsciousness with incontinence of stool and urine.

The remedies given in the treatment of surgical fevers, aseptic, septic and suppurating, should be studied in this connection.

**Sleep.**—Some patients suffer from sleeplessness after operation. Shock is sometimes the cause, and once reaction is fully established a quiet, refreshing sleep may be one of its first results. At other times the sleeplessness is due to the nervous tension and excitement of the operation. For such patients the surroundings should be made as pleasant as possible. Disagreeable friends should be kept out of the room, and anything in the environment that is irritating must, as far as possible, be removed. For medication, *Belladonna* 3x, when the patient is sleepy but cannot get to sleep, or *Gelsemium* 1x, when the patient can not go to sleep because he is not sleepy, will usually suffice to relieve the trouble. These drugs should be given in five drop doses, repeated every hour.

*Morphine, Chloral hydrate* or other strong hypnotics will need to be used but very rarely.

**Urine.**—The bladder is usually emptied just before taking the anæsthetic, but not always before leaving the room after the operation. Even if it is, the bladder may become seriously distended before the patient regains consciousness. Some patients are slow in awakening after the anæsthetic. If they happen to be neurasthenic ; or, if considerable water was left in the abdomen by the operator, the secretion of urine may be very rapid. Hence it is necessary to watch the bladder and to draw the urine if it becomes filled.

## CHAPTER III.

### CARE OF THE PATIENT AFTER REACTION FROM THE SHOCK AND ANÆSTHETIC.

Reaction is apt to be attended by a rise of temperature somewhat above the normal. Besides this cause, there are conditions attending operations that produce fever. This fever is known as traumatic surgical fever. There are three varieties: Aseptic, septic and suppurative.

**Aseptic Surgical Fever.**—The aseptic fever occurs after clean operations. The fever of reaction may merge into it. More frequently it comes independently, about twelve to twenty-four hours after the operation. It is probably due to the absorption of blood serum or fibrine from the clots; or of the exudate or broken down tissue that is present in appreciable amount in every wound. The temperature may range from 99° to 102° F., and the fever will last from a few hours to four or five days. The patient, as a rule, will feel well and have none of the usual accompaniments of fever.

#### HOMŒOPATHIC THERAPEUTICS.

This fever will subside without medicine. I believe, in most cases, the right remedy will hasten the return to normal. Among the remedies to be thought of are the following:

*Aconite* 3x.—When no other symptoms than the



abnormal temperature and pulse are present *Aconite* will be thought of first. It should also be given if marked restlessness and anxiety are present.

*Belladonna* 3x is indicated when in addition to the fever the face is flushed, the eyes bright or blood shot, and the head aches with a throbbing pain. The patient is sleepy, but cannot sleep; the throat is dry and sore; there may be pain in the stomach with nausea.

*Ferrum phosphoricum* 3x or 6x is given for these simple fevers by those who pin their faith to the tissue remedies. It seems to have a place between *Aconite* and *Belladonna*. It is a good remedy and may be given safely when in doubt as to which of the other two is indicated.

*Gelsemium* 2x is indicated if the patient is relaxed, yet restless; the face may have a besotted redness; there is but little thirst (the drug will act even if there is considerable thirst); the patient is "nervous" and cannot sleep.

*Bryonia alba* 3x is sometimes the remedy. There is a tenseness about the patient and yet he does not want to move; the face is red, but not so bright as the *Belladonna* redness; thirst is marked, the patient drinking considerable quantities of water without distress; the headache is made worse by any motion.

**Septic Fever.**—The consideration of septic and suppurative fevers naturally belongs to the chapter on "complications." They are discussed here for two reasons: First, they are an unavoidable complication in some infected cases. Second, the differentiation between them and aseptic fever can be made clearer by discussing them together.

Septic fever will occur only in those cases in which there are bacteria in the wound. It comes on within two days and is due to the absorption of ptomaines. These ptomaines result from the action of the bacteria on the exudate, blood clots and detritus in the wound. The wound itself will be red and inflamed, with some secretion of pus and broken down tissue. When a fairly vigorous granulating surface has developed, this detritus with its poisons will slough off, and the fever will subside.

While this fever is slower in developing than the septic fever, it may be very much more severe when fully established. The temperature will be higher, and will last for a week or ten days unless arrested by treatment. A dry tongue, a rapid pulse and delirium may accompany the fever in its severer forms. Without treatment, the condition will result in resolution, as before described; in suppurative fever; or the severer forms of septicemia or pyemia.

The treatment for this condition is both local and constitutional. The local measures call for the thorough cleaning out of the inflamed area. To accomplish this it may be necessary to remove a part or all of the stitches. When as many stitches are removed as is necessary to disinfect the part thoroughly, the wound should be cleaned with *Peroxide of Hydrogen*, followed by some germicide like *Bichloride of Mercury*, 1 to 1000 or 1 to 2000, or some other strong antiseptic. If there are blood clots or other detritus in the wound it may be necessary to use the curette in order to remove them. After making the wound as sterile as possible, a piece of iodoform gauze should

be stuffed lightly into it in order to keep up good drainage. When the wound is perfectly sterile it may be sutured again, if closing it will hasten the healing and secure a smaller scar.

The constitutional remedies will be discussed with those for suppurative fever.

**Suppurative Fever.**—Suppuration in the wound usually results in fever known as traumatic suppurative fever. This fever may follow as a sequel of septic fever. If a portion of the wound has healed in such a way as to enclose some pyogenic germs, they will form the focus of an abscess. When the balance of the wound cleans off the temperature will not drop as we would expect it to do, but will merge into the suppurative fever.

This fever presupposes the development of an abscess, and the absorption of the toxins of the pyogenic bacteria. It does not come on as soon as the septic fever. It will develop in from four days to three weeks after the operation. Unless it succeeds the septic variety as described, there will be a period of normal temperature, followed by a gradual rise which may reach 102° or 103° F. A fever coming on in this way should always make one suspicious of a "stitch abscess," and lead to a careful inspection of the wound. The wound may appear perfectly healed and without any redness or other signs of inflammation along the line of the incision. If the tissues be carefully palpated there will be found an area of hardness, which will be tender to the touch. In some cases, by the time the temperature has attracted attention, the abscess will have made such progress

that the tissues will be found swollen and inflamed. In rare cases a superficial abscess will form and discharge spontaneously, without any disturbance of temperature or pulse.

As in the previous condition, the treatment is both local and general. If the inflamed area is discovered early, before pus in an appreciable amount has formed, it may be treated expectantly. If a stitch seems to be causing irritation it should be removed. The inflammation will be found to have developed independently of a stitch as often as it is caused by one. The name "stitch abscess," is, to me, a misnomer. An antiphlogistic plaster, or some other of the clay poultices, does not seem to disturb the healing of the wound, but does relieve the soreness and in some cases helps to abort the suppurative process. As soon as it is certain that the pus has formed, the cavity should be opened so that it can be cleaned out thoroughly and drained. If there is much suppuration the wound should be dressed twice a day. The dressing should include cleansing the cavity with *Peroxide* and *Bichloride*, followed by light packing with iodoform gauze. As soon as the cavity is fairly sterile, the dressings should be repeated only often enough to keep it in that condition. Too frequent dressing retards the healing. The antiseptics injure the delicate granulations. The packing and removing of the gauze has the same effect. The fever usually subsides as soon as the pus is cleaned out.

Any one of the remedies discussed under aseptic fever may be called for in some stage of septic or suppurating fever. To this list I would add a few

of the drugs most frequently used when suppuration is present. Of course no list of this kind will include all remedies that may be called for. The predisposing causes of such fevers, the constitutional taint, may give a varied expression to the sickness, and furnish the most valuable indication for the constitutional remedy ; so that almost any remedy in the *Materia Medica* may be indicated.

#### HOMŒOPATHIC THERAPEUTICS.

*Arsenicum album* 3x.—A few of the symptoms that will lead you to a study of *Arsenicum* in these cases are these : The fever has developed the severer type. The patient is pale and prostrated ; the pulse is rapid and weak ; there is restlessness and anxiety ; there may be delirium with incontinence of feces and urine ; the thirst, while intense, is for small quantities frequently repeated, as the stomach is distressed by larger amounts.

*Baptisia* 1x.—*Baptisia* should be differentiated from *Arsenicum*. It has many similar symptoms. There is more active delirium, the patient imagining that his members are separated and that he can not get them together. There is as much restlessness but less anxiety. The incontinence of excretions is alike in both, but *Baptisia* is apt to have a more active diarrhœa.

*Rhus toxicodendron* 3x is another remedy for these low fevers. Its characteristic symptom is, "relief from motion." The patient suffers backache or muscular pains, but these pains are relieved by moving the parts involved. The patient may have no special

pains, he just feels bad, and will not lie still. It seems to give him temporary relief to move. He complains of the bed getting hard.

*Hepar sulphur.* 3x-30x.—This remedy will follow one of the remedies already discussed. It is indicated when suppuration threatens and in the simpler cases of hectic fever. Many physicians believe that *Hepar* "high," given at the very beginning of the inflammatory process, will abort the threatened abscess. I think it will, and I think the third potency will as well. When the bacteria are too vigorous to be headed off thus, *Hepar* seems to hasten the formation and separation of the slough. The pus, when this remedy is indicated, is thick, bland and creamy. There may be chills, remitting fever with sweating.

*Lachesis* 12x-high.—*Lachesis* is indicated in hectic fever when the parts about the wound take on a deep purplish color. The tissues are less vigorous, and the fever is of a severer type than in the *Hepar* cases.

*Mercurius* 3x.—The local conditions that call for this remedy are: a dirty, unhealthy condition of the wound; there is but little tendency to heal; the granulations are flabby. The patient may have some absorption of bile, as shown by slight jaundice and high colored urine. The tongue is broad and flabby and has a pasty coating. Whatever symptoms the patient suffers from are apt to be worse at night. He will sweat profusely, but without any relief to the fever or suffering.

*Echinacea.*—This drug has gained considerable reputation as an internal antiseptic with many physicians. They prescribe it whenever the patient is

suffering from septic infections. The "indicated remedy" is often alternated with it. To be effective, it must be given in fifteen to thirty drop doses of the tincture, repeated every two to four hours.

**Diet.**—The question of feeding the patient has already been touched upon in discussing nausea and vomiting. What has been said is almost wholly negative: what the patient should avoid eating in order to escape certain consequences. We have now come to the point where we have to decide what the patient should or can eat. In another chapter are given extended diet lists, to which reference will be made frequently. In this place only a few general rules will be given.

*Liquid diet* (see p. 90). The patient is to have only liquid diet until the stomach is settled and there has been a good movement of the bowels. This rule, like all good rules, has its exceptions. Mention has already been made of those cases that, seemingly, are only relieved of nausea after taking solid food. Occasionally a patient will have no other trouble with his stomach than an intense appetite. He will be so hungry that to refuse him food until his bowels move will do him more hurt than good. Hard and fast rules for diet are not practical. Careful judgment will be called for especially in this department of treatment.

*Soft Diet.*—As a general rule soft diet may be given after the bowels have moved and until the fever has subsided. Again, the idiosyncrasies of certain patients will lead to varying of the rule. If the stomach is still unsettled liquid diet should be continued

longer. If the patient is not well nourished by the soft diet he may be put on more solid food before the fever has entirely subsided.

*Full Diet.*—Full or table diet will follow the soft diet after the temperature becomes normal. It will be wise to keep a good many patients on a somewhat restricted diet as long as they remain in bed. Many convalescents are ravenously hungry, and, unless care is taken, will eat so much that the whole system becomes cloyed. After they are able to be up and take exercise they can stand a heartier diet.

**Excretions.**—In the majority of cases, if our patient's stools and urine are being passed regularly and naturally, it indicates that he is doing well. To secure such a condition is often a most difficult part of the treatment of the sick.

*Stools.*—If the after-care of the patient passes out of the hands of the surgeon, about the first question that the attendant asks is: "How soon should the bowels be moved?" As a rule, the bowels should be moved the second or third day. If the preparation has not been thorough, the bowels should be moved as soon as there is indication that fecal matter is in the rectum. The rules will vary somewhat according to the operation and operator. Some conditions require that the bowels should be confined for a time. In some the rule is to get them to moving as soon as possible after the operation. A large majority of the cases will fall between these two extremes and follow the general rule. Some operators, like some patients, are greatly disturbed until the bowels are moving. Such would take means to secure an early evacuation in nearly every case.



The next important question is, if the bowels do not move naturally as soon as desired, what means shall be used to make them move? The majority of cases will not move naturally. Some sort of assistance will be required for these early evacuations, as we cannot depend on any kind of dieting to help us. Injections of saline solution or soapsuds will often be effectual. If these fail, an injection containing a few ounces of *Olive oil* or *Glycerine* will usually secure a movement. If there is much gas in the bowels, the addition of a teaspoonful of *Turpentine* to the soapsuds will give relief. *Castor oil* or *Epsom* or *Rochelle salts* are sometimes used in injections because of their effect in stimulating general peristalsis in the bowels. If the salts are used, a larger amount is required than when they are taken by the stomach. Unless the patient is sensitive to the action of this drug, a heaping tablespoonful in a pint of warm water will not be too much for an adult. Whatever is used for the enema, it will act better if a colon or sigmoid tube of some kind is attached to the syringe, so the fluid can be carried above the rectum into the sigmoid. The injection should be made slowly, so the fluid will have time to work up into the bowel before expulsive peristalsis is excited.

Some people cannot take an enema without its inducing severe suffering. This suffering is sometimes due to an abnormal sensitiveness of the mucous membrane of the bowel. Sometimes the enema causes severe colicky pains. Other patients can be induced to retain so little of the fluid that it is ineffectual. While some of these conditions may be due to an over-

sensitiveness of the imagination of the patient, for practical purposes they are real and have to be dealt with accordingly. For such patients the proper treatment will be a laxative. I prefer *Epsom* or *Rochelle salts* in broken doses for such conditions. A saturated solution is prepared, and a teaspoonful is given once an hour, and is continued as long as is necessary to secure a movement. Sometimes two to four level teaspoonfuls of *Epsom salts*, or half the amount of *Rochelle*, given at one dose, will produce less irritation of the stomach than when the drug is given in broken doses. There are other laxatives that are preferred by other surgeons. Salts are generally available, are prompt in their action, and, as a rule, leave no unpleasant sequellæ. If a patient does not take salts nicely, or if he has taken some laxative that is effectual and mild in its action with him, he may take it. What we want is to get the fecal accumulation cleaned out of the intestine with as little disturbance of the general system as possible.

Prof. Streeter once said to his class, that he believed if we had a thorough knowledge of the Homœopathic Materia Medica, and could spend time enough on each case, we would find the indicated remedy that would be effectual in relieving the constipation in these surgical cases, but that few men in active practice could or would spend the time necessary, so long as the resort to the cruder drug was so easy and satisfactory. Whatever theoretical notions we may have regarding such a statement, it is sensible and practical. I should always prescribe the indicated remedy to the best of my ability. In a good percentage of

cases it will be all that will be needed. In others it will not. The glandular and muscular torpor that follows an operation is sometimes very persistent. The diet at this period leaves but little detritus in the bowels; the glandular secretion is much less than usual; the usual stimulus of muscular exertion is wanting; an obstinate constipation naturally results.

A good routine to follow in the treatment of these cases is as follows: If the condition of the patient does not require an immediate movement of the bowels give the indicated homœopathic remedy. It should be borne in mind, however, that the "indicated" remedy would take into account all the symptoms present. The constipation might be among the lesser important of those for which the drug is chosen. If the patient has had no emptying of the bowel before the operation an enema is given the day after, unless the bowels move spontaneously. If the preparation has been reasonably thorough, effort to move the bowels may be postponed until the second or third day. Then an effort should be made to secure a movement by an enema. If the bowels have not moved by the fourth or fifth day a cathartic should be given. This outline applies simply to the getting rid of accumulation of fecal matter in the bowels. There may be other and special indications for the giving of laxatives. These will be considered when discussing the special conditions in which they would be called for.

After the first movement a few patients will have no further trouble, the bowels moving naturally every day or every other day. More cases will suffer from

constipation as long as they are confined to the bed. The homœopathic remedy may, in some instances, be sufficient to keep the bowels regular. Many cases will require either laxative medicines or enemata to move the bowels. They should move as often as every other day. If they fail to do so naturally, artificial means must be used.

When it is necessary to resort to active measures an enema should be given, unless there are some contra-indications. The contra-indications are, an irritable condition of the rectal mucous membrane so that the patient is not able to retain enough of the clyster to move the bowels ; the development of severe colic whenever an enema is given ; or, if the patient is made weak or faint by the injection. Some of the various kinds of clysters are discussed on p. 58.

Sometimes there is not peristalsis enough to carry the fecal matter into the colon. In such a case the alimentary canal might become clogged and toxic absorption take place in spite of the enemata. If the indicated remedy and injections fail, a resort to laxatives will be in order. Of course, in this stage it may be possible to regulate the diet so as to help relieve the condition.

Another condition against which you need to be on your guard is fecal impaction in the rectum. This condition may develop even when the bowels are moving regularly and apparently in sufficient quantity. The symptom that is characteristic is a sense of fullness in the rectum as though the bowels would move and yet can not ; or, if they do move, there is no relief from the pressure. This symptom should

always lead to a thorough digital examination. If there is any question about the bowels moving properly, inquiry should be made to learn if there is any sense of fullness in the rectum. Some patients will make no complaint for some time, or until the accumulation is very large.

When the impaction is present the best way to relieve the patient is to break up the mass and remove it with the finger. This will usually be a painful process, and in rare cases will require the use of an anæsthetic. A blunt spoon curette may be used instead of the finger, but the finger is safer and better. It will seldom be possible to soak up the mass with injections so that the patient can pass it. It will have to be removed mechanically.

*Diarrhœa* seldom troubles a patient after an operation unless he is a sufferer from the chronic form. When diarrhœa is present it can usually be readily controlled by correcting the diet and giving the indicated remedy.

We will discuss a few of the remedies that will be needed in the treatment of these bowel troubles.

#### HOMŒOPATHIC THERAPEUTICS.

*Nux vomica* 3x.—This prime remedy is no less potent in surgical than in general practice. It meets so many of the alimentary conditions following an operation that few patients get through their treatment without needing it. The symptoms which call for its use are nausea; sour stomach; anorexia; insufficient movement from the bowels; backache and headache, especially a dull frontal headache. The

waking from sleep at three or four o'clock, and only half sleeping from that time until morning, is an important *Nux* symptom. When present, this drug usually has the other symptoms that the patient complains of, and *Nux* is his remedy.

*Bryonia alba* 3x.—This is another remedy that is frequently useful in these bowel cases. One of the most constant characteristics of *Bryonia* is, that the patient is worse from motion. He is so conscious of this that he does not want to move, he wants to be left perfectly quiet. We find fewer stomach symptoms than in *Nux vomica* patients. There is headache, which may be either frontal or occipital, and it is worse from motion. *Bryonia* has fever which is attended by intense thirst. The abdominal pains are those of inflammation, the peritoneum being involved. Again, the aggravation from any movement of the body is marked. The constipation seems due to a dryness of the mucous membrane and a torpor of the bowels, hence we get no passage until there is a large accumulation, and the stool is hard and dry "as if burnt."

*Alumina* 30x.—"Chief among remedies for constipation due to dryness of the intestinal tract stands *Alumina*." (DEWEY.) This remedy is compared with *Bryonia*. Both have the dryness of the intestine, but *Alumina* has more difficulty in expelling the stool because of paresis of the rectum. The following are some of the classical symptoms: Hard, knotty stools, like sheep dung. Inactivity of the rectum, even soft stools are passed with difficulty.

*Hydrastis* 2x or tincture.—There are few specific

symptoms that call for *Hydrastis* in constipation. A catarrhal condition of the mucous membranes is the characteristic of this drug. In constipation the stools are coated with mucus or mucus may be mixed through the stool. There is apt to attend this condition an empty, gone feeling in the stomach. Anorexia is usually present in *Hydrastis* cases.

*Aloes* 2x.—Occasionally diarrhoea instead of constipation will follow an operation. For this condition *Aloes* will be indicated frequently. The symptoms are pain in the hypogastrium preceding the stool, but relieved after stool. Much gas passes with the stool. When the desire for stool is felt the patient must have immediate attention, as the sphincters may be so weak that they cannot hold back the passage. Considerable prostration may follow a movement of the bowel.

*Podophyllum* 1x-3x.—Profuse watery stools with or without pain or flatulence. Even when it would seem that the bowels must be completely emptied, still the profuse stools continue. There is often present a tendency to prolapsus of the rectum.

*Cinchona* 1x-3x.—This remedy has painless, undigested stools. The abdomen may be distended with gas, but the gas does not pass so as to relieve the condition. Absence of desire for either food or drink. If the patient has lost much blood it is an additional indication for this remedy.

*Arsenicum album* 3x.—The constitutional symptoms more than the local, guide in the selection of this remedy. Perhaps the same is true of all remedies, but with the most of them the general symptoms

group around some local condition. With *Arsenicum*, the pale face; the weak, prostrated condition; the restlessness and anxiety; the dry tongue; the intense thirst, the patient wishing but a small quantity at a time, but wants it oft repeated; with these symptoms *Arsenicum* is indicated whether the patient has constipation or diarrhœa. *Arsenicum* is much more frequently called for when diarrhœa is present than when there is constipation. The diarrhœa is often chronic in nature, the patient having suffered with it before having had the surgery. Almost every kind of loose stool is given under this drug. Perhaps most characteristic is the excoriating of the anus by the stool. In chronic cases the remedy is potent even if this symptom is absent.

**Urine.**—The danger of allowing the bladder to become overdistended when the patient comes out from the anæsthetic slowly, or after considerable water has been left in the abdomen, has already been alluded to. In all cases the nurse should see that the distention of the bladder does not occur. If the patient cannot pass the urine voluntarily it should be drawn as often as once in six to eight hours. The quantity passed should be measured and recorded. If the urine has to be taken with a catheter it will often be better to have a regular time for taking it than to depend on the wishes of the patient. The pain or annoyance to the patient of using the catheter may lead him to allow the bladder to become overdistended before he will call for assistance.

The catheter should be perfectly sterile. This sterility may be secured by keeping the instrument in



some competent antiseptic and rinsing in sterile water just before using, or it may be boiled. When it is prepared for use it should not be touched by the physician until his hands are sterile. If a rubber or soft gum catheter can be used it is preferable to a metallic instrument. In some cases of stricture or enlarged prostate the metal catheter will have to be used because a soft catheter cannot be passed. Just before the urine is drawn the meatus and parts about should be made sterile by cleansing with *Bichloride* or some other antiseptic. If there is evidence of urethritis the urethra should be flushed out first. To accomplish this a recurrent catheter is very convenient. If such an instrument is not at hand a small catheter may be passed into the urethra and the solution allowed to run out beside it. A saturated *Boric acid* solution, 1 to 4,000 *Permanganate*, or 1 to .0,000 *Bichloride*, should be used.

Some patients will be obliged to have the urine drawn as long as they remain in bed, whatever the character of their operation. In some cases the nature of the operation is such that catheterization is necessary even though the patient can pass the urine voluntarily. When the catheter has to be used in this way there will almost always be set up some irritation of the bladder. If a patient is kept in the recumbent position for some time, even though he can pass the urine naturally, the bladder may become somewhat irritated. Kelly claims that investigations made in Johns Hopkins Hospital show that this irritation is due to the retention of highly concentrated urine in the bladder. The urine is always concentrated after

an operation, and the recumbent position of the patient prevents the bladder from being entirely emptied either naturally or with the use of the catheter. Saline enemata will increase the quantity of urine passed during the first few days after operation and will relieve irritation. If the bladder should become infected in any way, as would be shown by the presence of pus in the urine, it should be washed out with *Permanganate of Potash*, 1 to 2,000 or 4,000; or *Boric acid* saturated solution, or some other mild antiseptic. This irrigation should be repeated once or twice a day, according to the amount of pus present and the relief it gives the patient.

*Suppression* of the urine is a rare complication in post-operative cases. The suppression may be partial or complete. If the patient was suffering from a chronic nephritis it would be fair to assume that an acute exacerbation had been caused by the irritating effect of the anæsthetic. When suppression occurs in healthy kidneys it is due to the anæsthetic upon them, together with the low blood pressure resulting from the shock or hæmorrhage. Symptoms of uræmia will soon develop. The nervous system is most profoundly affected. A severe convulsion may occur without other premonitory symptoms than the scanty or absent urine. At other times the condition will develop with a more or less severe headache. The spasms may be confined to muscles or groups of muscles, causing a nervous twitching or hiccough. Vomiting is usually present. Stupor and coma are among the later developments of uræmia.

The treatment seeks to improve the blood pressure

and to relieve the system by stimulating the other excretory organs, as the skin and the bowels. The first is accomplished by the use of *Nitro-glycerine* in 1-50 gr. to 1-100 gr. doses, repeated every half-hour or hour as the case demands. *Digitaline* may be given in the same size doses as the former remedy, but should not be repeated more than once in two or three hours. Both of these drugs can be given hypodermically. Should the patient be vomiting, this method will be much better than to give drugs by the mouth. These remedies also have some specific diuretic action in addition to their action on the general circulation. Hypodermoclysis of normal salt solution should be given if salt enemata fail to relieve.

Sweating and purging may be useful in relieving the system of the poisonous substances that the kidneys should have taken care of. *Pilocarpine* in 1-10 to  $\frac{1}{4}$  gr. doses, given every two hours, is an efficient sudorific. Steam baths may be used to sweat the patient if there is nothing about the surgical condition to contra-indicate their use. One way of securing this kind of a bath is to conduct the steam from the spout of a boiling tea-kettle under the bedclothes. The clothing should be so lifted from the patient that the steam will circulate around him and not be concentrated on one part. A method used by Dr. Hinsdale is to boil half a bushel of ear-corn and put that in the bed about the patient. It is very effective as a steaming process, and the corn may have some special influence upon the kidneys.

In the majority of cases, active treatment to prevent the uræmic symptoms will have been instituted before

the patient is taken with convulsions. Should convulsions occur inhalations of *Chloroform* may be given during the attack. *Chloral hydrate* in 15 to 30 drop doses may hold the spasms in check.

#### HOMŒOPATHIC THERAPEUTICS.

*Belladonna* 3x, *Causticum* 3x or *Gelsemium* 1x will help to overcome the paralysis or weakness of the bladder. The differentiating symptoms of the remedies will be the general characteristics rather than the symptoms of the urinary function. *Belladonna* should also be thought of for the bladder irritation.

The following are the remedies most frequently used for cystitis and suppression:

*Belladonna* 3x.—This remedy will be useful, especially in the congestive stage at the beginning of trouble. There will be the usual symptoms of cystitis, as frequent desire to pass urine even though there is but very little in the bladder. There is some pain, especially at the close of micturition. This remedy will give place to others as the inflammatory condition becomes more marked.

*Cantharis* 3x is the remedy first thought of by many physicians when there is burning and smarting during micturition. The more the burning the more is it indicated. The burning may involve the whole urinary tract, including the kidneys and ureters. The urine is scant and may be bloody.

*Mercurius cor.* 3x.—This remedy should be selected if there is marked tenesmus. The tenesmus of the bladder may attend irritation and tenesmus of the rectum. The symptoms are worse at night, as a rule.

There may be foul, depressing night-sweats. If there is bile or albumen in the urine, or the tongue has a dirty white, pasty coating, the remedy will be more certain to relieve.

*Berberis vulgaris* 1x.—With this drug the bladder symptoms are not so severe, but there is more backache. I always give *Berberis* for backache unless some other remedy is clearly called for. I believe its usefulness is not limited to backache with kidney origin. With *Berberis* the urine is scant, high-colored and may be bloody, and the pains are apt to extend to the hips.

*Arsenicum album* 3x is indicated for the more chronic conditions. There may have been previous inflammation of the bladder, which has been excited into a more active form by the operation or conditions immediately following it. Pus will be present in the urine. The urine will be scanty and high-colored; it will be passed with difficulty, causing burning.

*Hepar sulphur.* 3x.—In some cases, when there is considerable pus in the urine and yet it is passed without very marked distress, *Hepar* is the remedy. There may be a hectic condition present.

*Apis mellifica* 1x to 3x has burning and stinging on urinating, but its reputation is based on its action on the kidneys rather than on the bladder. It is especially indicated for scanty or suppressed urine. It will sometimes bring about a healthy action of the kidneys when the cruder kidney remedies have failed to even start the urine.

**Sutures.**—There are a few general rules about the removing of sutures. The non-absorbable sutures

should, as a rule, be left undisturbed for from five days to two weeks; the time varies somewhat with different operations. These variations will be noted when discussing the various conditions. If there is much inflammation about the sutures or they are cutting the tissues, they should be removed without waiting the usual time. This rule may be varied in some instances, as when the removal of the sutures would allow the wound to gap unduly. If there is marked inflammation or evidences of considerable infection in the wound, as shown by the presence of septic fever, the wound should be opened and cleaned out. If there is an inflammatory exudate about a suture, the precursor of a "stitch abscess," the stitch should be removed.

Before removing a stitch the wound should be bathed with *Bichloride*, 1 to 2,000, or some other effective antiseptic. The end of the thread should be caught with a forcep and pulled so that, on one side, a portion of the buried thread is raised above the skin surface. It should be cut through in this portion with sterile scissors. The part of the stitch that has been above the skin is more liable to be infected than the buried portion, and if it is dragged through the wound it might deposit germs in the deep tissues.

The gut and other forms of absorbable sutures will sometimes need removing. These sutures are supposed to be absorbed in from five days to two or three weeks. Sometimes chromacized or other forms of specially prepared animal suture will be almost non-absorbable. Then they will have to be treated the same as any other non-absorbable threads. At other times the

tissue about the thread may become infected before it has had time to become absorbed, when it must be removed.

Buried sutures are only used when the surgeon expects the wound to heal by first intention. Surgeons' expectations are not always realized, and these sutures sometimes become infected. If they are non-absorbable they will lead to the formation of sinuses that will only heal after they are removed. If the sinus is large enough the thread may be caught with a forceps, cut and pulled out. If not the sinus should be enlarged. These sutures can occasionally be removed by catching them with a blunt hook. They can be removed in this way only when the tissue in the grasp of the suture has been cut through by it, or when the suture has become partially absorbed and can be easily broken. It is better practice to enlarge the sinus than to work blindly in endeavoring to get the thread. The cutting will cause less injury to the tissues than would the bruising.

## CHAPTER IV.

### SPECIAL COMPLICATIONS.

**Gas in the Bowels.**—After an abdominal operation and occasionally after other operations, there seems to be a paresis which leads to weak peristalsis, and occasionally to fermentation and the formation of gas in the bowels. The abdomen may be distended, and the patient suffer greatly from pressure. The distention may even threaten his life. The diagnosis of the condition will seldom present any difficulties. There may or may not be rumbling of gas in the intestines. The fever will be no more than can be accounted for by the surgical shock and reaction. The patient will be relieved as soon as the gas passes. The condition can readily be distinguished from septic peritonitis with distention. If the peritonitis is a result of the operation it will not come on so early. There may be no more fever with the peritonitis, but the pulse is rapid and weak; the abdomen more sensitive, especially to any motion, and the muscles rigid. The general appearance of the patient indicates a deeper-seated sickness. If there is paralysis of the bowels due to the peritonitis, such as occurs from severe septic infection, there will be no gurgling of gas. Delirium is usually present, and coma may supervene rapidly.

Tympanitis in itself would cause no such symptoms, but in the exhausted condition of the patient who has



gone through a severe operation, the pain due to the distention and the embarrassed respiration may so lower the vitality as to turn the scales against him. Besides, the distention favors the development of peritonitis if any infection be present.

**Treatment.**—The treatment should be begun as soon as the first symptoms of gas accumulating appear. Do not wait until distention has produced severe suffering and peristalsis has been paralyzed. The enemata with which the treatment should begin will do the patient no harm and perhaps some good, even if there is no great accumulation of gas to come away.

The first step in the treatment is to give the patient a high colon flushing of saline solution or soapsuds. If the stomach has become settled, much benefit will be derived from administration of the proper internal remedy. It often happens that the stomach is still irritable from the anæsthetic, or is made irritable by the tympanitis, so that drugs will be vomited up if taken. In such cases the dependence will be almost wholly on local measures. If the simple enema is not effectual, a teaspoonful of *Turpentine* may be added and *Turpentine* stupes applied to the abdomen. The following mixture is used in obstinate cases with good results: *Rochelle salts*, 2 ounces; *Glycerine*, 4 ounces; *Turpentine*, 1 ½ to 2 drachms; water, 1 pint.

When the enemata are not sufficiently successful, massage of the colon will be helpful. Another recourse which has helped when other measures failed is the dilating of the sphincter ani. This may be done with a bivalve rectal speculum, like Pratt's, or by inserting

the fingers and stretching the muscle. It is not necessary to paralyze the sphincter. It should be stretched enough to cause the patient some pain and then relaxed. The stretching should be repeated fifteen or twenty times per minute, and continued for half a minute to a minute.

#### HOMŒOPATHIC THERAPEUTICS.

Homœopathy furnishes some remedies that are exceedingly helpful in combating flatulence. While I would not think of depending on them to the exclusion of other measures, I know that we can get the condition under control much sooner, as a rule, when giving the indicated remedy than if we do not.

*Carbo vegetabilis* 3x. —“The flatulence of *Carbo veg.* is more in the stomach, and that of *Lycopodium* more in the bowels.” The abdomen is greatly distended, and there is relief from eructations. When gas passes from the bowels it is very offensive.

*Cinchona* 1x has marked distention of the abdomen, which is not relieved by eructations. There may be passage of large quantities of gas, with griping pains. Should this condition attend the anæmia due to the loss of blood this remedy will be especially useful.

*Lycopodium* 12x. — The characteristic symptom of *Lycopodium* is rumbling of gas in the bowels. When the distention and griping is attended by this rumbling it is the remedy.

*Colocynthis* 3x. — *Colocynthis* has more pain than distention, or perhaps we should say, pain out of proportion to the distention. The characteristic of the *Colocynthis* pain is that it is relieved by pressure.

*Terebinth.* 3x.—Excessive distention of the abdomen, meteorism and colic are given as the symptoms for which this remedy is prescribed. It may be used locally as well as internally. A little of it may be sprinkled on a hot, moist compress and laid on the abdomen.

**Post-Operative Jaundice.**—Post-operative jaundice has not received the attention it deserves from surgical writers. It is a complication frequently met in the after-care of surgical cases. The discoloration may vary from a slight yellowing of the conjunctiva to a most decided icterus. The condition shows itself in from two to four days to two weeks after the operation. It may be attended by no special symptoms, or may be a part of the picture of the most serious blood changes.

Many patients with this condition will tell you when questioned that they have had spells of jaundice before. These patients are probably the subjects of a more or less chronic catarrhal condition of the bile ducts. This catarrhal condition has been aggravated, causing the bile pigment to be absorbed into the blood. Anæsthetics, especially ether, cause some catarrh of the mucous membranes, and so might easily aggravate an old condition. Besides this, the liver partakes of the general sluggishness of the intestines and the intestinal glands that always follows an anæsthetic and the forced quietude that is made necessary by the operation. Thus we see that, with a predisposition to jaundice, post-operative cases present very favorable conditions for its development.

These cases of jaundice, whether aggravations of

chronic conditions or induced primarily by the operation, are usually mild in character and respond readily to medical treatment.

There is another form of jaundice, which is of less frequent occurrence than simple catarrhal, but is possibly of more importance to the surgeon. It is due to toxic agents "which destroy the red cells of the blood, or, more rarely, the hepatic cells as well" (BUTLER, page 79). Mayo Robson seems to believe that the toxic agent causes catarrh of the bile ducts as well, for he says: "Catarrh of the bile ducts probably always accompanies jaundice from whatever cause" (Gall-Bladder and Bile Ducts, page 59). The importance of this form to the surgeon is due to the fact that it is caused by Chloroform and Ether, and by ptomaines and toxines. I am not aware that there are any means of knowing how much destruction of blood cells or injurious effect on the liver may result in any given case, or whether this type of icterus may not develop in a very serious form after a comparatively simple operation.

The icterus due to toxines or ptomaines is usually a complication of septicæmia or pyæmia. It may be a symptom in the more rapidly developing septic condition, sapræmia. I believe it may be so pronounced as to overshadow all other evidences of blood-poisoning.

I have had two fatal cases of post-operative jaundice. The first was operated on for tubercular glands of the neck and a large periglandular abscess in the axilla. A few weeks before the operation in question she had taken Chloroform, at which time a tubercular

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will protect the parts; or a cotton batting "dough-nut" shaped cushion may be used. In using these devices, care must be exercised that they themselves are not made sources of irritation.

When the skin is once broken, the treatment should follow the line of other open sores. The parts should be made aseptic and the sore treated with compresses moistened with *Calendula*. Some cases will do nicely if the sore, when made aseptic, is covered with cotton and gauze and over this flexible *Collodion* be applied in quantity sufficient to seal the sore perfectly. In this way I succeeded in healing a bad sore on a diabetic patient for whom a gangrenous foot had been amputated. The man had incontinence of urine. This dressing protected the sore perfectly. It had to be renewed once in three or four days. Drugs will not often be selected for this condition alone. The medicinal treatment will be directed more, as a rule, to the condition that predisposes to the bed-sore than to the sore itself. *Arsenicum*, 3x; *Lachesis*, 12x; *Hepar sulphur.*, 3x or 30x, or *Silicea*, 30x, may be given with benefit at times. See suppurative fever, p. 52.

**Delirium.**—Delirium resulting from an operation is of rather rare occurrence. It is probably due to shock or weakness and has been compared to the insanity that sometimes follows exhausting fevers.

It will be differentiated from the delirium caused by fever by there being no elevation of temperature or increased pulse rate. The aged are more prone to this form of delirium than are others.

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dition will not last long. The principal mental perversion in cases that have come under my observation was a determination to remove the dressings.

The treatment will include careful watching with, possibly, some restraint. The patient should be well nourished. The best treatment for the insanity will be to build up the general health. *Belladonna*, *Hyoscyamus*, *Stramonium*, or *Ignatia* may be indicated and used with benefit.

**Secondary Hæmorrhage.**—Secondary hæmorrhage is of rare occurrence in modern surgery, but was one of the most dreaded sequella of operations in the pre-antiseptic days. If a wound suppurates, the thrombus that occludes the artery may become infected. When this occurs, instead of its giving place to scar tissue it breaks down, and when the ligature with which the artery was tied sloughs off or is absorbed, the thrombus is forced out and a hæmorrhage occurs, the severity of which will depend upon the size of the vessel.

Occasionally compression may suffice to stop the bleeding. More frequently the wound will have to be opened and the vessel secured by a new ligature. Sometimes it may be safer to expose the vessel above the wound and tie it in continuity. To do this it will be necessary to know the relation of the tissues in the region in which the artery is to be tied. The parts should be thoroughly sterilized. The incision will vary in length according to the depth of the vessel. Important nerves often lie near large vessels. These nerves should not be included in the ligature.

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matic fevers. In them the toxic development is limited to the wound or tissues in its immediate neighborhood. If bacteria enter the blood they are so few in number as to have no appreciable influence. The fever is due to absorption of toxins from this focus. As soon as the wound is cleaned or abscess evacuated, the development of toxins is stopped and the system soon throws off the poisonous agents, and the temperature and pulse return to normal.

In septicæmia we have, in a truer sense, blood poisoning. We no longer have the toxic matter floating in the blood carried to the various centres of function, there to create its disturbing work. But the blood itself is toxic, either through the presence of bacteria and toxins, or because of changes in its composition, as a direct result of the toxins in it, or of both. The disease is now beyond the wound and immediate tissues, it is systemic.

Septic fever and suppurative fever may merge into septicæmia. At first the fever is due merely to the toxins in the blood. Gradually the bacteria, as well as the toxins, get into the circulation and the blood changes of septicæmia are established. In this stage the cleaning out of the wound and abscess might check or lower the temperature, but it will not cure the fever.

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The fever of septicæmia develops several days after the operation. Its beginning may be obscured by the presence of septic or suppurative fever. There may be, at the beginning, and for two or three succeeding days, sharp chills. When established, the fever is remittent in character and is usually attended by considerable sweating. The lymphatic glands, especially the spleen, may be enlarged. The changes in the blood lead to icterus, and often to diarrhœa. Sordes tend to collect on the teeth, the mouth and tongue become dry and a typhoid condition supervenes. In fully developed cases the prognosis is bad.

The treatment should begin by cleaning out the wound. This will remove some of the toxic matter and an important focus of septic development and absorption. Aside from making the wound aseptic the treatment is medicinal.

#### HOMŒOPATHIC THERAPEUTICS.

Homœopathy furnishes a number of remedies of proven value in treating this condition. Some of these remedies are the following :

*Arsenicum album* 3x.—This remedy has a leading place in the treatment of septic conditions. From its symptomatology some writers would restrict its use to low forms or late stages of the trouble. I have been accustomed to give it early in nearly all septic cases, continuing it in alternation with some other remedy that seemed indicated, unless the other remedy so completely covered the case that it seemed all-sufficient. The presence of septic matter is one indication for the drug. The fever may be steadily high

or remittent; the pulse will be rapid and small; the thirst intense, but for small quantities of water frequently repeated.

*Rhus toxicodendron* 3x.—This drug is of benefit in fevers of a typhoid type. There will be a dry tongue; rapid, weak pulse; extreme restlessness, moving seems to give some relief; bed seems hard. Both *Arsenicum* and *Rhus tox.* have diarrhœa in which the movements may be involuntary.

*Bryonia alba* 3x has a low fever, but the patient wants to remain perfectly quiet. The symptoms are aggravated by moving about. There is intense thirst for large quantities of water. Involvement of the serous membrane usually calls for this remedy.

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*Echinacea*.—Many physicians believe that this remedy has a specific action, neutralizing in some way septic toxins; they give the drug in all septic cases. To be of benefit it must be given in ten to twenty drop doses of the tincture, repeated every two to six hours.

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**Pyæmia.**—This dread condition develops in puerperal cases more often than in surgical. It is due to the breaking up of an infected thrombus, which is then poured into the circulation as septic emboli.

is dry. The mouth has a bitter taste. There is intense thirst; food lies heavily in the stomach; the abdomen may be distended and sensitive to any motion; the bowels are constipated, the stools hard and dry. The local symptoms will be sharp, stitching pains through the liver, aggravated by deep breathing or motion.

*Digitalis* IX.—“*Digitalis* is useful in the worst forms of jaundice if the pulse be irregular and intermittent, and if there be rapid prostration of strength” (DEWEY). There is extreme thirst with a faint, weak feeling in the stomach; constipation or diarrhœa; marked general prostration. The cardiac are the guiding symptoms for this drug.

*Arsenicum album* 3x is indicated in the severer forms of blood poisoning. There is a low hectic fever with great prostration and delirium. The tongue will be dry and brown; the stools diarrhœic, and possibly passed involuntarily. The natural secretions, as tears and mucus, are acrid and irritating to the skin if they come in contact with it.

**Bronchitis.**—Post-operative bronchitis does not differ in its essential symptoms from bronchitis due to other causes. It is more apt to follow Ether than Chloroform. Death may result from the involvement of the bronchial capillaries or from a secondary pneumonia.

The cough and expectoration may be exhausting if the patient is suffering from shock, or exceedingly painful if there is abdominal tenderness or peritonitis.

## HOMŒOPATHIC THERAPEUTICS.\*

*Tartar emetic* 3x, with its loose rattling cough, is most frequently indicated.

*Phosphorus* 3x has dry, hacking cough, tightness of the chest and hoarseness.

*Bryonia* 3x, also, has dry cough. It is especially indicated if the pleura or peritoneum are involved.

*Kali bichromicum* 3x has tough, sticky mucus, which may cause retching before it can be loosened from the larynx.

These are only a few of the many remedies that will prove useful in combating bronchial irritation.

**Hiccough.**—Mention has already been made of the hiccough due to uræmia. Other causes may produce the same condition: indigestion, peritonitis and various cerebral conditions. Sometimes the hiccough seems to be due to weakness, and elderly patients are more prone to it than the younger. At times no cause can be found. Hiccough should always be regarded with anxiety. It may be the surface expression of a serious condition of the patient. Besides this, it is in some cases exceedingly annoying, painful and exhausting. *Nux vomica* 3x is the remedy I most frequently use. Dose, three to five drops, repeated every few minutes until the patient is relieved. *Hyoscyamus* 3x, *Veratrum viride* 3x, and other spasm-producing remedies may be helpful. Any general or household measure, like the rapid swallowing of water, holding the breath and counting, etc., that is not contra-indicated by the surgical condition, may be tried.

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From the etiology we would expect several days to elapse before it is established. The wound may be actively septic or may have completely healed. It is believed that in some instances weeks elapse before the chills and fever of pyæmia manifest themselves. When once fully established it usually has a steady course deathward. The septic emboli are filtered out in the capillaries of the lungs, liver, kidney, brain or other tissues. Wherever an embolus lodges it becomes the focus of a new abscess.

The condition will be recognized by repeated chills, fever and sweats. At first pyæmia may seem very like septicæmia; a severe chill followed by high fever and later by profuse sweating may usher in the condition. The temperature generally falls to near, and occasionally below, normal. The pulse usually remains rapid during the remissions in the fever. In a few hours to two or three days there will be another chill, fever, sweat and remission. These will be repeated with more or less regularity as long as life lasts, or until convalescence is established.

Other symptoms will depend on the location of the metastatic abscesses. If in the lungs, labored respiration, bronchial irritation and pneumonic conditions will be present; if the abscesses are in the liver, it will be painful and enlarged, and there may be jaundice; if in the brain, septic meningitis may be set up. If the abscess does not involve the membrane, it will lead to a gradual development of compression symptoms. There may be local or general spasms or palsies, local headache or tenderness, with a gradually developing stupor and coma. In whatever organ or

tissue the abscesses develop, they will cause disturbed function, pain and tenderness. The disintegration of the blood constituents will be like septicæmia, and a toxic jaundice is apt to be present in the later stages. Death may occur in a few days, or a semi-chronic condition may develop that will last for weeks.

Some writers regard the condition as fatal when once established. I believe some cases recover, but the prognosis is always exceedingly grave. In the interval between the chills the patient will appear so bright that it is hard to realize that a fatal malady is present.

The treatment is both local and constitutional. If the wound is septic, it should be cleaned out and treated with antiseptics. It must be remembered that a thrombus in a nearby vein may be infected when the general condition of the wound is good. If the vein with the infected clot can be located, it should be opened and the clot or thrombus removed. If any of the metastatic abscesses are accessible, they should be opened and treated the same as other abscesses.

The general strength of the patient should be kept up by giving plenty of easily digested, nutritious food. Most writers recommend giving alcoholic stimulants freely. The remedies that may be called for are the same as those that have been discussed under septic and suppurating fever and septicæmia.

## CHAPTER V.

DIETETICS. BY MYRTA M. WOODSON.

It is universally conceded by physicians that the diet is an important factor in the recovery of a patient. We trust that the contents of this chapter may prove suggestive and helpful to, at least, a few of the many who have the care of the sick.

The chapter contains lists of foods that belong to the different kinds of diet, lists for special conditions, and recipes.

### DIET LISTS.

**Liquid Diet.**—1. Cream soups ; Tomato, pea, corn, celery, rice, spinach, asparagus, potato, nut and berry.

2. Gruels : Oatmeal, cornmeal, cream of wheat, flour, glutine (for diabetics).

3. Fruit juices (these all may, or may not, be albuminized) : Lemonade, orangeade, unfermented grape juice, currant juice, berry juice, tamarind water and apple water.

4. Milk : Peptonized, albumenized, buttermilk, malted milk and milk porridge.

5. Stimulating drinks : Tea, coffee, cocoa.

6. Broths : Beef broth, mutton broth, chicken broth, bouillon, consomme, oyster broth, clam broth, oyster soup, clam soup, beef tea and beef juice.

7. Eggs : Raw eggs and eggnog.

8. Cooling and nourishing drinks : Oatmeal water, rice water, barley water and toast water.

9. Ices and ice cream are sometimes included in liquid diet lists.

**Soft Diet.**—Soft diet includes everything in liquid diet list and the following :

1. Bread : Soft bread ; dry toast ; milk, water or cream toast, brown bread (after the first day on soft diet).

2. Eggs : Poached, soft boiled, shirred and baked.

3. Cereals (thoroughly cooked) : Cornmeal, oatmeal, rice, sago, wheaten grits and cream of wheat.

4. Desserts : Junket ; custards ; milk puddings ; rice, thoroughly cooked ; tapioca ; jellies ; apples, baked and stewed ; prunes, whipped and stewed ; ices and ice cream.

**Convalescent Diet.**—The list of food for convalescents includes everything in liquid and soft diet lists and the following :

1. Breads : Wheat, rye, Boston brown bread, graham and biscuits.

2. Farinaceous, as in soft diet.

3. Meats : Broiled steak, mutton, fish, game and fowl, or stewed fowl. Also calf's head, calves' brains, shell fish and oysters.

4. Eggs, as in soft diet.

5. Vegetables : Tomatoes, green peas, string beans, potatoes (Irish and sweet), lettuce, cresses, asparagus, onions, celery, spinach and mushrooms.

6. Drinks, as in soft diet.

7. Desserts : Custards, creams, jellies, ripe fruits and stewed fruits; no pastry or rich puddings.

## NUTRIENT ENEMATA.

Nutrient enemata are given whenever the patient is unable, for any length of time, to take food into the stomach. It is a poor substitute for nature's way of obtaining nutriment, but by it one may be kept from starving for several days. Some surgeons recommend giving a nutrient enema soon after all serious operations.

Milk in some form is generally used in this method of feeding. More nutriment will probably be taken from it by the mucous membrane if it is peptonized than if it is raw. However, fresh milk may be used if facility for peptonizing is wanting.

Almost any of the predigested foods may be used in place of, or with the milk. Many of them contain wine or other liquor. If such are used, but little if any brandy should be added to the enema.

Brandy and whiskey are very irritating to the rectal membrane and should be given only every other time unless especially ordered.

The following formulæ will suggest the method of preparing the enemata :

1. One egg ; pinch of salt ; peptonized milk, 3 oz. or  $\frac{3}{8}$  cup ; brandy.
2. The whites of two eggs ; peptonized milk, 2 oz. or  $\frac{1}{4}$  cup. Addition of salt aids in the absorption of the egg.

## FEEDING.

If the patient does not wish to eat as much as he should, particular care must be taken to prepare the food in a tempting manner and to serve as daintily as

possible. Everything given should be nourishing and appetizing, should be served in small quantities, but in wide variety.

The following lists are suggestive of what may be given at the various meals :

Breakfast.—Drinks : Tea, coffee, cocoa, milk or albuminized fruit juices; fruit; cereal with cream; eggs: omelet, scrambled or poached on a piece of round toast, or soft boiled in a hot cup ; muffins or gems.

Dinner.—Broiled porterhouse or tenderloin steak; baked potatoes; bread or rolls; pretty sallad, as apple salad in apple case ; custard, baked in souffle dish ; tea, cocoa or milk.

Supper.—Broiled squab, raw oysters or meat balls, asparagus tips on toast, fresh or stewed fruit, bread cut in fancy shapes.

*Foods that may be taken together.*—Meat; eggs, soft boiled, poached, shirred or baked ; potatoes, baked, boiled or mashed ; fruit, sauce and ices, may go with the following : Stewed tomatoes, salads, spinach, or cucumbers, acid drinks, etc., any food prepared with vinegar.

Meats, vegetables cooked in milk, or served with cream sauce, cream soups, and eggs prepared with milk may be given with fruits, vegetables, drinks, etc.; containing no acid.

*Foods that should not be taken together.*—Any food prepared with milk should not be given with lemonade, tomatoes, salads containing much vinegar or any food served with vinegar or lemon juice.

The following are lists of suitable foods for a few postoperative conditions :



*Anæmia.*—Soups : Rich vegetable soups, whole beef tea, chicken or beef broths containing chopped meat.

Fish : All fresh fish, boiled or broiled ; raw oysters.

Meats : Beef and mutton (tender juicy steaks), lamb chops, boiled ham, broiled bacon, chicken and game.

Eggs : Soft boiled, poached, scrambled, raw with sherry wine.

Farinaceous : Cracked wheat, rolled oats, mush, hominy, whole wheat bread, corn bread, brown bread, milk toast.

Vegetables : Fresh vegetables well cooked.

Desserts : Custards, rice or apple pudding, baked apple, fruit jams, jellies, some fresh fruits.

Drinks : Chocolate, milk and fruit juices.

*Moderate Fever.*—Any of the foods in the "liquid diet" list, also small amounts selected from the "soft diet" list, especially soft cooked eggs and toast.

*Diarrhœa.*—As a rule the less food taken the better ; milk soup, well boiled ; clam juice or mutton broth, with addition of some cracker crumbs, croutons or thoroughly cooked rice ; a little mutton well broiled and sweet breads ; eggs, soft boiled or poached on dry toast ; rice, sago, arrowroot and toasted crackers, no sugar.

*Constipation.*—Meat broths, oyster soup ; boiled fresh fish, raw oysters, fresh tender meats, poultry and game ; cereals, graham bread and corn bread ; onions, spinach, potatoes, asparagus, peas and string beans ; salads, with oil ; ripe fruits and fruit juices.

*Flatulence or Fermentative Dyspepsia.*—Clear, thin soups of mutton, beef or veal ; fish—fresh fish, shad, cod and raw oysters ; meats—beef, mutton, lamb,

calf's head, tongue, tripe, broiled chopped meat, sweet-bread, chicken and game ; eggs—boiled, poached and raw ; hominy and cracked wheat, without cream.

*Sour Stomach or Acid Dyspepsia.*—Soups: Clear thin soups of mutton, beef or oysters ; shad, cod, perch, bass, fresh mackerel and raw oysters ; meats—beef, mutton, lamb, tripe, tongue, calf's head, sweet bread, broiled chopped meat, tender steak, chicken and game ; eggs—boiled, poached and raw ; cracked wheat, hominy, rolled oats, rice, sago, tapioca, crackers, dry toast, stale bread, corn bread, whole wheat bread and graham bread ; spinach, sweet corn, string beans, green peas, lettuce, cresses, celery and asparagus ; no milk.

*Tubercular Subjects.*—Drinks: Fresh milk (cool or warm), buttermilk, chocolate, tea and coffee.

Bread: Whole wheat bread, brown bread and cream toast.

Meats: Rare, tender steaks of beef or mutton ; rare, roast beef ; mutton or lamb chops ; fat bacon ; sweet breads and game.

Eggs: Every way except fried.

Vegetables: Potatoes, onions, green peas, string beans, spinach and tomatoes (all well cooked) and celery.

Fish: All kinds of fresh fish, oysters and clams.

Soups: Turtle or oyster soup ; mutton, beef, clam or chicken broth ; cream of celery or tomatoes ; whole beef tea ; rice, pea or bean soup.

Desserts: Custards, milk puddings, baked or stewed apples with fresh cream, and ripe fruit.

## RECIPES.

It is hoped the following recipes will help the nurse to prepare food in sufficient variety, and to serve it daintily enough to make it appetizing to almost any patient.

*Cream Soups.*—The white sauce is the base of all cream soups. It is added to an equal quantity of vegetable stock.

*White Sauce.*—One cup milk, one tablespoonful butter, one tablespoonful flour, one-fourth teaspoonful salt, white pepper. Melt the butter and add the flour and salt. Cook until it bubbles. Add the milk gradually or all at once, and stir until it thickens.

*Celery Soup* (for one).—One-fourth cup celery, one-half cup water, one-half cup milk, one-half tablespoonful butter, one-half tablespoonful flour, pinch of salt and pepper. Clean the celery, cut into one-half inch pieces, cook in boiling water until soft. Renew water as it cooks away. Rub through a strainer after mashing celery in the water.

Make white sauce with butter, flour and milk. Then add celery stock. Serve when steaming hot.

For tomato soup, use one can tomatoes to one quart white sauce, one quart milk, one-fourth cup flour and one-half cup butter.

*Beef Broth.*—Cut clean meat in one-half inch cubes. Let stand one hour in cold water, allowing one pint of water to one pound of meat and one-third pound of bone. Bring slowly to boiling point. Cook six hours without boiling. Cook on back of stove or in a double boiler.

*Beef Juice.*—Heat a slice of steak a few minutes over a clear fire. Cut into small pieces, press out the juice, using a lemon squeezer or meat press which has been heated. Season with salt, serve in a colored wine glass.

*Clam and Oyster Juices.*—Wash clams or oysters and remove bits of shell—use three clams to one-half cup water. When shells open, strain, season and serve.

*Gruels.*—Any mush may be thinned with cream, milk or water, strained and served hot as gruel.

For Gruels: One-half cup cornmeal, oatmeal, cream of wheat, etc., stirred into one quart boiling water makes about the right consistency. Cook any of these fifteen minutes over fire, then put in double boiler and cook, cornmeal three hours, oatmeal one hour, and cream of wheat one hour. Season with cream when served, or use part milk while cooking it.

*Albuminized Fruit Juices.*—Into one cup lemonade, orangeade, grape juice, etc., put white of one egg slightly beaten. Mix thoroughly, strain and serve.

*Milk.*—Milk should never be boiled unless ordered; heat in double boiler.

*Peptonized Milk.*—Put two tablespoonfuls of cold water in a goblet or glass. Dissolve in this the powder contained in one of the Fairchild peptonizing tubes, then add fresh cold milk to fill the glass. Stir this mixture thoroughly and drink immediately, sipping slowly.

*Eggs—Soft Boiled Eggs.*—Place the egg in one pint of boiling water. Remove from the fire, cover and allow to stand from five to eight minutes.

*Hard Cooked Egg.*—Place the egg in cold water and when the water boils remove from the fire and allow it to stand twenty minutes on the back of the range, then put into cold water.

*Poached Egg.*—Break the egg into a saucer, slip into boiling water, cover, remove to cooler part of the fire and cook five minutes, or until white is firm and a film has formed over the yolk; take up with a skimmer, drain, trim off the rough edges and serve on a slice of round toast; season to taste.

*Omelet.*—One egg, a little salt, white pepper, one tablespoonful milk, one-half tablespoonful butter; beat yolk of the egg until it is light and creamy, add the seasoning and milk; beat the white until stiff, but not dry, cut into the yolk; heat an omelet pan and rub it all over with butter, turn in the omelet and spread evenly on pan; when it is set put into a hot oven for a few minutes to dry slightly on top, fold and serve immediately.

*Creamy Egg.*—Use same proportions as for omelet; beat egg slightly, add butter and seasoning; cook in double boiler, as it thickens scrape it away slowly with a spoon; continue in this way until only a small amount of liquid remains; if overheated, it will curdle; serve on toast.

*Baked Egg.*—Butter a saucer or small, shallow dish slightly, slip into this one or two eggs, be careful not to break the yolk; place the dish in a pan of boiling water and cook in the oven until the white is set; season with salt and serve.

*Raw Egg.*—Separate yolk and white of egg; to the beaten yolk add one tablespoonful of brandy and one

of sugar, or juice of one orange and one-half lemon and sweeten to taste (about one tablespoonful); fold in white after beating it light; serve in pretty glass on small plate.

*Eggnog*.—Beat egg very light; add one-half tablespoonful brandy and one teaspoonful sugar, or one-fourth teaspoonful vanilla, a little nutmeg and sugar; fill glass with milk; the milk may be added to the yolk (beaten) and the white folded in last as in raw egg.

*Toast*.—Cut bread one-fourth inch thick; hold away from the coals until dried out; hold closer and toast a golden brown.

*Toast Strips*.—Cut bread one-half inch thick in strips one-half inch wide and three inches long; dry out in a slow oven and serve when a golden brown.

*Croutons*.—These are pieces of bread cut in one-half inch cubes and prepared the same as toast strips; they are nice to serve with cream soups.

Toast may be cut in round pieces, in crescents, diamonds, etc., for a little variety.

*Cereals*.—Cereals should be thoroughly cooked; fine cereals, like cornmeal, should be moistened with cold water before stirring into boiling water to prevent lumping.

*Directions for Cooking*.—Measure water and cereal carefully; have water boiling and add cereal gradually; cook over fire seven or eight minutes, stirring constantly; put in double boiler and finish cooking.

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TABLE OF AMOUNTS, AND TIME REQUIRED FOR COOKING  
DIFFERENT CEREALS.

<i>Cereal.</i>	<i>Amount.</i>	<i>Water.</i>	<i>Time.</i>
Oatmeal, or Rolled Oats, . . . . .	1 cup . . . . .	3 cups . . . . .	1 hour.
Cornmeal, . . . . .	1 cup . . . . .	3½ cups . . . . .	3 hours.
Cream of Wheat, . . . . .	1 cup . . . . .	6 cups . . . . .	½ hour.
Hominy (coarse), . . . . .	1 cup . . . . .	4 cups . . . . .	6 to 10 hours.
Barley (coarse), . . . . .	1 cup . . . . .	8 cups . . . . .	14 hours.

*Steaks and Game.*—All steaks, small game and fish are very nutritious and easy of digestion if broiled and seasoned with a little butter, pepper and salt.

To Broil.—If a broiler is not handy an ordinary toaster will serve as well; have a hot bed of clear coals; have steak cut one inch thick, salt and put it in broiler; hold near the coals until seared, then turn other side next to fire until seared, turn every ten seconds until done; if liked rare, cook eight minutes; if well done, ten minutes. Game may be broiled in the same way, the time of cooking depending on the size of the bird. The broiler should be well greased before using. All fat and skin should be trimmed from the steak before broiling.

*Scraped-Meat Balls.*—Scrape round steak, mould into balls one inch in diameter, broil, and season with a little salt and butter.

### THE TRAY.

The appearance of the tray often has a marked influence on the appetite of the patient, hence it is thought in place that some hints be given on its preparation for the sick room.

Have a good tray; use nice, fine linen; use the best china in the house; a flower or spray of green on the

tray makes it more attractive. Set the tray as a place at the table, thus: The plate in the front, with knife and spoon at right, and the fork at left; cup and saucer back, a little to the right; glass at the tip of the knife, butter at the tip of the fork, salts and peppers with sugar bowls at the back.

Parsley and lettuce make pretty garnishings for the food.



## CHAPTER VI.

### SURFACE TUMORS AND GROWTHS.

The female breast is frequently subjected to surgical operations. The simplest of these is lancing an abscess of the gland. The treatment for this condition is to secure good drainage and to make the abscess cavity sterile by the use of antiseptics.

The removal of fibromata will usually leave a clean wound which will be closed without drainage. If pain in the wound or fever develops the operative field should be examined. If the stitches are irritable they should be removed. If fluid is present it may be bloody serum or pus. The former should be evacuated through a small opening or with an aspirator. When the cyst is emptied thoroughly, pressure should be applied so as to bring the walls into apposition. Healing will usually take place without further trouble. If pus is present the opening should be large enough to give good drainage. After the pus is evacuated the treatment will follow the usual plan for suppurative fever, p. 52.

Other operations on the gland are usually for its removal. When cancer is the condition for which the gland is removed, the axillary space is usually cleared of its fat and lymphatic glands. As a rule the wound will heal by first intention. The dressings need not be disturbed until time to remove the stitches, unless there is increasing pain in the wound or fever develop-

ing. The latter conditions would indicate inflammation and should have immediate attention. The tension stitches, those put in to relieve the tension at the edges of the wound, should be removed at the end of a week. The coapting stitches should be left a week longer, unless they are causing inflammation. In such case they should be removed as soon as the condition is discovered.

Hæmorrhagic cysts or abscesses should be treated the same as similar conditions following operations for fibroids. If at the operation so much tissue be removed with the breast that the flaps cannot be made to cover the denuded surface, the after-care will vary somewhat from that described. The uncovered space may be left to granulate. If the wound keeps clean the dressing need not be changed oftener than once in three or four days. A piece of gauze on which is smeared a little *Calendula ointment* should be put next to the wound. Some prefer dusting the wound with Iodoform or other powder. The ointment will help to prevent the dressing sticking to the wound and injuring the granulations when it is removed. If the granulations become exuberant they should be curetted or touched with silver nitrate. Sometimes the denuded space will be covered with skin-grafts as a part of the operation. If not, and the surface to granulate is large, the grafts should be put on later.

The patient may be allowed to sit up in four or five days and to be about in a week. She can begin to use her hand some at the end of two weeks, but it will usually be two or three months before she can use it for very active work.

Many of these patients suffer from neuralgic pains about the side and along the costal margin. These pains are probably due to injury to nerves supplying the skin over the parts. They sometimes cause the patient some anxiety, she fearing that they indicate an extension of the disease. In my experience medicine has not seemed to influence them. They disappear in from two or three weeks to two or three months.

Œdema of the arm should always be regarded with suspicion. It may be due to invasion of the lymphatics by the cancer cells or to pressure of the scar tissue. Massage will sometimes improve the condition.

Should any nodular growths appear, either about the wound or in the neighboring lymphatic glands, they should be removed as soon as discovered. So long as the disease is limited to the surface areas there is reason to hope that it may be eradicated. Cases are recorded where patients have been cured after several operations for recurring nodules. These nodules should not be left until considerable tissue has become involved and new metastases have formed.

If there is evidence that cancer is developing in the mediastinum, lungs, liver or other internal organs, operations for surface conditions should not be made with the idea of curing the patient. Even with such complications, operations, by removing a bleeding, offensive, suppurating mass, may prolong life and lessen suffering.

I have, after operations for cancer, been in the habit of giving *Arsenicum* for a year and a half to

two years as follows: Fowler's solution, three drops, or *Arsenicum album*, 2x, three or four times a day for one year. During the second year the remedy is given only in alternate months. From experience I believe that *Arsenicum* in high or low potencies is effective in checking the development of cancer. For some reason that is not clear to me, I prefer the high potencies before, and the low after operations.

Cancer may develop in other parts, but, wherever located, the general plan of treatment just outlined will be applicable.

The same treatment is also applicable to sarcomata.

**Lymph Nodes.**—Lymphatic glands that require surgical treatment are usually cancerous, tubercular or gonorrheal. Other infections may make surgical conditions in these glands, but their post-operative care will present no special features.

If these glands are removed before suppuration and periglandular inflammation is established, the operation will be clean and the treatment will follow the general plan of aseptic wounds. If an abscess has been simply incised, it will generally discharge for a long time in spite of the most careful antiseptic measures. The gland is seldom destroyed by the inflammation. It will remain in the wall of the abscess as an infected foreign body. If the abscess does not heal in two or three weeks, the gland should be removed with a curette. When left to nature, it sometimes takes months for a small gland to slough and the abscess to heal.

There are many other tumors of the skin and subcutaneous tissue as lipomata, fibromata, angiomatica,

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warts, wens, etc. The postoperative care for these conditions will present no features differing materially from those already discussed.

## CHAPTER VII.

### THE PREPARATION AND AFTER TREATMENT OF EYE, EAR, NOSE AND THROAT OPERATIONS.

BY ROYAL S. COPELAND, A. M., M. D.

#### THE OPERATION FOR CATARACT.

The end to be accomplished by an operation for cataract is the restoration of useful vision. This is possible only by perfect repair of the wounded tissues, normality of the refracting media, and proper reaction of the retina. An eye, in which vision will be satisfactory ultimately, may be delayed in its progress towards usefulness by interference in resolution, by opacity or cloudiness of one or more of the media, or by temporary functional inactivity of the long diseased retina.

In the restoration of vision the chances are that success will crown the efforts of the surgeon, provided the immediate results of the operation are satisfactory. While the effect of a brilliant operation may be lost by secondary changes, or consequent disease; yet, other things being equal, the probability of success depends, in a large measure, upon the preparation, the operation and the prevailing conditions of the first three or four days, particularly the absence of suppuration.

**The Chances of Success.**—With the question of operation arises the query: “What are the chances of success?” The answer to this question will be based

upon the observation and the individual experience of the operator. In estimating the chances and forming a conclusion in any given case there are two sets of conditions to be studied. These relate, first, to the patient himself, and, second, to his surroundings before, during and immediately following the operation.

The general conditions unfavorably affecting the result in a cataract extraction are those which lower the power of resistance to germ invasion, infection being imminent if anything interferes with perfect closure and rapid healing of the wound.

- **Age.**—Naturally the first consideration is the age of the patient. This is less important probably than is his general condition. Since the infirmities of the flesh are in direct proportion to the years it is to be expected that the chances of a successful operation are lessened in old age. However, some of the best results met are in patients past eighty. If the organs are active and the appetite and bodily vigor good, the chances of success are excellent. If the tissues be firm and elastic and the bodily health good, advanced age is not detrimental to the ultimate result.

**General Conditions.**—The failure of a cataract extraction is not fore-ordained simply because the general health of the patient is impaired. Especially in chronic disease, if the circulatory organs be free from serious involvement, a good result may be expected. But any condition, acute or chronic, which affects the circulation is liable to delay the healing process and expose the patient to the danger of secondary infection. Conditions which are comparatively unimportant in grosser surgery may be of the greatest impor-

tance in weighing the chances in the cataract operation. Therefore, kidney and heart lesions, lung disease, syphilis, and, indeed, any condition which has an effect upon the circulation or blood-vessels or upon the reparative processes must be considered in making a prediction of the result in cataract extraction.

In diabetes, for instance, a disease which frequently has cataract as a symptom, the result must be more or less uncertain. The bad prognosis is due, not alone to the disease itself, but also to the necessary neglect of the post-operative precautions. In diabetes the change from the ordinary mode of life is dangerous. The inactivity and consequent interference with elimination may induce delirium, diabetic coma, and death. That has been an occasional experience. In such patients, therefore, the usual post-operative treatment, rest in bed, must be modified. While the results in diabetics have been fairly satisfactory, yet it is probable they are not as good as they would be could the usual practice be followed. In such cases iritis has been a more common complication than could be wished. In rheumatic and syphilitic patients, too, iritis must be expected and is likely to be much more serious than in patients free from both diatheses.

Acute conditions are of more consequence. Immediately following the operation the patient may have a chill, the result of shock or exposure; the power of resistance to germ invasion is lowered at a critical time; infection takes place, suppuration follows, and the eye is lost from what the laity and many doctors call "taking cold." In a recent series of one hundred extractions, the writer had a loss from suppuration of



1 per cent. This patient was a "roustabout" in a livery stable; he was careless regarding personal cleanliness, wore two suits of woolen underwear, summer and winter, slept in his clothes in the hay loft, and would seem to be immune to exposure of any sort. But the bath tub, the thin night shirt, and the clean bed were too much for him; a few hours after the operation he had a chill, followed by high fever, and pus appeared in the wound on the second day. In spite of every effort, there is more or less pyogenic germ invasion in every case and lowered resistance from any acute systemic disturbance, or radical departure from the accustomed habits, renders the wound liable to suppuration.

**Local Conditions.**—It were carrying coals to Newcastle to speak of the importance of local disease and its possible effect in causing infection. Previous disease of the eye, involvement of any of its parts in an inflammation, disease of the lids, lachrymal apparatus, or nasal accessory sinuses, all have a bearing upon the prognosis in cataract extraction. Even the normal eye, bathed in the normal fluids, is under constant siege by watchful bacteria; the enemy is ever ready to leap into any abrasion and to occupy the site of the smallest solution of continuity. Many forms of micro-organisms are always present in the eye. Most of them, of course, are not pyogenic, but some become so when introduced into the tissues. The staphylococcus is the most dreaded and, in one or more of its forms, is ever ready to enter the wound and begin its work of pus production.

It is not claimed that by any process yet known to

science harmful bacteria can be absolutely expelled from the eye without injury to the organ ; however, any preparation which reduces to the minimum the number of these agents is a consummation devoutly to be wished. In a struggle for life against heartless foes it is reasonable that the chances are in proportion to the number of the enemy. That system, then, which eliminates the most pathogenic bacteria is the system which, other things being equal, will give the largest percentage of satisfactory results in cataract extraction.

**The Patient's Preparation.**—It is the writer's practice to require before an extraction the same preparation of the patient which is imposed upon the subject of a capital operation where a general anæsthetic is to be given. The night before, the patient is given a bath and shampoo, with thorough scrubbing of the eyebrows, forehead, nose and cheeks ; the eye to be operated is irrigated with a saturated *Boric acid* lotion ; the closed eyelids, margins, brow and eyelashes are mopped with 1 : 5000 *Bichloride of Mercury* solution ; the eye is then covered with a thick pad of gauze, dipped in *Bichloride* solution and bandaged. Care is exercised not to manipulate the parts so much or so roughly as to abrade the surface and, if the skin is very sensitive, the gauze pad is moistened with *Boric acid* lotion instead of the *Bichloride of Mercury*.

This dressing is left in place until early morning. It is then removed, the eye irrigated, a 1 per cent. solution of *Atropine* instilled, the surrounding parts mopped as before and the bandage replaced. No

further attention is paid the eye until time for operation.

In the preparation of the patient, the writer has never gone to such lengths as to follow the advice of Dimmer, who advocates shaving the eyebrow and clipping the lashes. In exceptional cases, however, this practice may be desirable. With a patient like the "roustabout," already mentioned, for instance, such extraordinary care in preparation is necessary to escape infection.

**The Place of Operation.**—It is not necessary, of course, to have access to a modern operating room in order to have success in the cataract operation. But if glass and marble are not to be had, it is the part of wisdom to operate in as clean and light a place as possible; every precaution helping to exclude a chance of infection is trouble well spent. The dining room and the kitchen, previously unprepared, are not suitable places for operating; neither is the bedroom, where the patient has spent the night and which perhaps is unaired from many nights' occupation.

The writer's choice is to select any room, large or small, preferably one into which the sun's rays fall and which is capable of free airing, or, better still, one which may be spared long enough to disinfect. This, or a corner of it, may be transformed into a beautiful operating room by tacking clean sheets over the carpet, upon the walls and ceiling. All this may seem unnecessary, but, when the oculist exercises the same care in the cataract operation that the modern surgeon does in a laparotomy, the percentage of loss from suppuration should be reduced almost to nil.

Everything which touches the patient and everything which the surgeon and his assistants may touch should be previously sterilized ; tables should be covered with sterilized sheets or towels ; basins, irrigators, cotton, gauze, bandages, instruments, solutions, all should be sterilized. The chances to avoid pathogenic infection are thus greatly increased. Recalling the old days when the parlor table was dusted with the same cloth used to wipe the rust off the instruments, and yet there was healing by first intention, all these details seem stupid ; but comparison of results now with results in former times must convince the most skeptical that the modern way is far superior. Our science should become so exact that in a series of selected cases we might predict the absence of suppuration in every single one.

**The Dressing and Post-Operative Treatment.—**In the after treatment of the patient, the eye is bandaged very carefully, first applying a round of sterile gauze and just filling the orbit with cotton. The unoperated eye is also covered. The patient is then removed to his room, and, keeping the recumbent position, lifted into bed. The room chosen should be large, airy and sunny, but, above all else, well ventilated. The chance of secondary infection is much less in such a place than in a crowded ward with air poisoned by the exhalations of a multitude, or even of a few, sick people and the attendant nurses.

It is the practice of the writer to keep the patient upon his back, or carefully turned from side to side, for three or four days. Prolapse of the iris, so common in the experience of some, is, in his opinion, due

to neglect of this precaution. A patient given unlimited freedom after the first day will usually abuse it. He sits up, reaches over the side of the bed, and by some sudden wrench of the body or violent closure of the eyelids breaks open the wound. Of course the iris prolapses. On the other hand, if the patient is impressed from the beginning with the danger of movement and the necessity of perfect quiet, this possibility is avoided. This precaution may be a work of supererogation, but its results are satisfactory.

Unless rise of temperature, displacement of the dressings, or some unusual cause makes it necessary, the first re-dressing is made at the end of forty-eight hours. The hands, the dressings, the solutions, are all prepared as carefully as at the time of the operation. The bandage is removed, the brow, eyelids and surrounding parts are carefully cleansed with the *Bichloride*, the eyelashes mopped, and finally the eye examined. These precautions are perhaps unnecessary in most cases, but should the wound be unclosed and "leaky" from any cause there is almost as much danger of infection as at the time of extraction. An excess of caution is a good thing in a surgeon.

If everything is all right, a drop of sterile 1 per cent. *Atropine* solution is instilled and the eye re-dressed. After the first time, the dressing is made daily. In an uncomplicated case the patient is permitted to sit up in bed on the fourth day and to be dressed on the fifth. Should iritis ensue a little longer time in bed is the usual prescription. Otherwise, the patient is out of doors in ten days and quite himself at the end of two weeks.

## IRIDECTOMY.

The preliminary preparation and the after treatment are the same, generally speaking, as for the cataract extraction. There are some exceptions, however. If the operation is made for the relief of glaucoma, *Atropine* is contra-indicated at all times. The rest in bed, too, need not be so strictly enforced nor so long continued.

## STRABISMUS.

Before this procedure, if a general anæsthetic is not to be employed, it is unnecessary to make any preparation until the day of operation. It is not so necessary either to give strict attention to every detail. However, nothing is lost by following the suggestions made in the section devoted to cataract.

After the operation the dressing is applied and left in place until the next day; then it is removed, the eye carefully washed out with *Boric* lotion and the pad re-applied. On the second day the dressing may be permanently removed unless the patient is more comfortable with a light eye pad.

PLASTIC OPERATIONS AND OPERATIONS UPON  
THE LIDS.

The eye and surrounding parts are prepared as indicated under the heading *Cataract Operations*. The after treatment should be the same as for other plastic operations.

## THE MASTOID OPERATION.

Before this operation, one of the most delicate in surgery, the strictest attention should be given to

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the preparation of the parts involved and of the patient himself. All that has been said regarding the preparation of a patient about to be trephined applies here. In addition the ear should be syringed out with 1: 5,000 *Bichloride* solution and, after drying, plugged with a strip of sterile gauze. The hair must be shaved for a considerable area about the ear, because it may be necessary to open the cranial cavity and the part should be in readiness for this emergency.

The dressing applied after the operation may be left for several days. The patient is kept in bed, and the first redressing may be postponed for four or five days unless fever develops. When it has been determined to change the dressing the same care must be exercised in the preparation of the hands and everything to touch the patient as is demanded in the after treatment of any case where the brain has been exposed.

### TONSILLOTOMY.

No after treatment is required beyond advising the patient to avoid solid, especially hard, food for two or three days. There may be some fever and local tenderness, but usually the symptoms are of no consequence. The only thing to be feared is secondary hæmorrhage. Where this is mild a styptic, like *Perchloride of Iron*, will ordinarily stop the bleeding; should it continue, however, the actual cautery—either the thermal or electro-cautery—will end the trouble. Frequent gargling with diluted *Glycothymoline* or *Listerine* will promote the comfort of the patient.

## TURBOTOMY OR NASAL POLYPUS REMOVAL.

Beyond spraying the parts with some cleansing solution no previous preparation is essential. The only indication for after treatment is the control of hæmorrhage. Packing the nasal cavity with sterile gauze or gauze dipped in sterile melted vaseline will usually suffice. Adrenalin may be used to control the bleeding, which is sometimes quite profuse when the packing is removed. Before attempting to take from the nose any cotton or gauze, the parts, thoroughly illuminated, should be sprayed until the hardened dressing is soft and pliable. Gentleness and patience must be exercised.



## CHAPTER VIII.

### SURGERY OF THE TRACHEA.

**The Trachea.**—Operations upon the trachea will be made because of wounds, diseased conditions of the larynx, tumors, and foreign bodies that have accidentally been drawn into the air passages during inspiration. There will be two classes, one in which the opening in the trachea is closed, and one in which a tube is left in the wound for the ingress and egress of air.

The after care of these cases will include the treatment of the field of operation and such complications as may arise. If the operation has been a clean one with complete closure of the wound the case will consist in keeping the dressings from slipping and so allowing the wound to become exposed and infected.

In restless people with short necks the proper retention of the dressings may be exceedingly difficult. The dressing immediately over the wound may be fixed with strips of adhesive plaster; the outer dressing held by a bandage. If this bandage is put on with a few figure of eight turns, one loop passing under an arm while the other encircles the neck, the dressings will be pretty well fixed.

If drainage has been put in to prevent the formation of an hematocoele, it should be removed in twenty-four to seventy-two hours. After removal the wound should be treated aseptically. If the wound be-

comes infected or an abscess forms, it should be treated the same as similar conditions in other wounds. See p. 53.

When the wound in the larynx is kept open by the insertion of a tube the treatment will depend somewhat on the condition for which the operation is made. This operation is made when diphtheria or some other condition of the larynx threatens suffocation. Again, when operation is to be made on the mouth or larynx and there is danger of blood being drawn into the lungs a laryngotomy or tracheotomy is made so that the upper part of the air passage can be closed.

Especial care will be needed to keep the wound in the neck from becoming seriously infected. Cleanliness about the wound and the use of antiseptics will be called for.

If there is much mucous or membranous discharge the inner portion of the tracheal tube should be removed as often as once in two hours that it may be kept clean and free for the passage of air. The outer tube should be removed occasionally by the physician that it may be kept cleaned, and also that the wound may be inspected and treated. This should be done only often enough to insure cleanliness in both the tube and the wound. It may be necessary to remove it as often as once in twelve hours, or it may be left much longer, according to the condition of the patient and the wound.

In order to prevent irritation of the lungs, the patient should be kept in a warm room (80° F.). The air should be kept moist, as it will assist his breathing. To prevent dust or insects being drawn into the

lungs, a piece of coarse-woven gauze should be placed over the mouth of the tube. While all the air passes in and out of the tube the patient will be unable to talk. If it is desired that he should talk, a tube should be used that will allow a portion of the expired air to pass through the larynx. If the tube does not completely fill the trachea the same result will be secured.

**Complications.**—When the wound in the trachea is closed at the time of operation, inflammatory exudate, or œdema, or the pressure of an hœmatocele may make such interference with the respiration that the wound will have to be reopened and a tube inserted.

One complication that the patient might experience is difficulty in swallowing. This may be due either to the swelling of the parts and consequent pressure on the œsophagus, or to soreness in the neck. In severe cases it will be necessary to sustain the patient by nutrient enemata.

*Bronchitis* and *pneumonia* are other complications that will sometimes develop. The mere presence of the tube may set up some irritation and cough. A bronchitis is recognized by the presence of mucus, by the irritative cough, and râles. There may be some fever. Pneumonia symptoms are about as follows: A distinct chill, followed by fever; dulness over a portion of the lungs; absence of the respiratory murmur or presence of the peculiar vesicular crepitation. Should there be fever without any history of chill, and with little or no cough, the lungs should be carefully examined, for pneumonia might be present.

The treatment of these sequelæ of surgical conditions is medicinal and should follow the same lines as y develop from other causes. The estab-

lished superiority of the homœopathic remedies in diseases of the lungs gives to the homœopathic surgeon who is operating about the chest or throat a distinct advantage.

#### HOMŒOPATHIC THERAPEUTICS.

The indications for the drugs in these conditions are so well known to every homœopathic physician that I will do little more than give the names of a few of those most frequently used.

*Aconite* 3x and *Veratrum viride* 1x vie with each other in the early stage of the disease. The pulse is rapid and strong, the fever high. There is possibly more anxiety in the *Aconite* than in the *Veratrum* patient.

*Bryonia* 3x has dry, hacking cough, attended by sharp cutting pains, especially when the pleura is involved. Pains increased by any motion.

*Phosphorus* 3x has dry, hacking cough, with bloody expectoration.

*Antimonium tartaricum* 3x.—Loose rattling cough; less mucus comes up than one would expect from the character of the cough. Coughing may be attended by vomiting. Patient lacks vitality.

*Kali bichromicum* 3x has thick viscid mucus, difficult to raise. The hepatization is slow to give way.

*Iodine* 2x is another remedy to be given when resolution is delayed, especially if there be any tubercular tendency. The presence of hectic fever calls for this remedy when tubercular conditions have existed. I often give *Iodine* as a constitutional remedy, alternating with it some remedy that meets the more acute symptoms.

## CHAPTER IX.

### SURGERY OF THE LUNGS AND PLEURA.

The lungs will sometimes be operated upon without opening the pleural cavity. This is only done when the inflammation set up by an abscess or a foreign body in the lungs has caused an adhesion between the pleural surfaces through which an opening can be made. In most cases the pleural cavity will have become infected, and the resulting empyema will require surgical treatment. Assuming the pleura to be healthy and unopened, we have a wound extending through considerable inflamed tissue into the lung. In most cases a portion of a rib will have been removed. The indications for treatment will be to keep the pleura from being opened, to relieve pain, to secure resolution in the injured tissue.

The inflammation for which the operation is made will often have "fixed" the lung so that there will be but little motion in the diseased side. In such cases the only bandage needed will be such as is necessary to hold the dressing in place. If the lung expands during respiration, some bandage that will lessen the movement of the injured side will protect the pleura and lessen the pain. An ordinary binder, or some form of chest bandage that will encircle the thorax, will be most convenient for the doctor and comfortable for the patient, especially if there is much suppuration. If the case is aseptic, or nearly so, there

will be little or no discharge, and a broad adhesive or surgeon's plaster encircling the chest sufficiently to fix the injured side will be very practical. An opening can be made over the wound so that special dressings can be applied. These special dressings will consist of sufficient gauze and cotton to absorb all the discharges.

In other respects the treatment will follow the usual lines for abscesses or clean wounds. The wound in the lung will usually be walled off by inflammatory exudate, so that *Peroxide of Hydrogen* or other mild antiseptics can be used to clean out a pus cavity or make the wound aseptic. When the cavity opens into a bronchus, any fluid injected into the wound is liable to pass into the throat and cause strangling. If the patient is turned toward the injured side during the treatment, the choking will be partially prevented. In some cases it will be better not to use any injections, depending on good drainage and such lung action as may be present to clean out the cavity. If fluids can be used, *Calendula*, one part of the non-alcoholic tincture to four of sterile water, is a valuable drug. A large rubber drainage tube should be used in all cases. If there is much discharge of bloody serum, gauze should be packed in the wound cavity about the tube. Any exuberant granulations should be scraped away. The internal remedies will be the same as those used in the treatment of suppurative fever (p. 54). If pneumonia or bronchitis develop, the remedies will be the same as for similar conditions following operations on the trachea.

The pleural cavity will, as a rule, have become infected, and empyema will complicate the operation and after-care. The treatment will then be the same as for operations following uncomplicated empyema. The lungs will collapse whenever the pleura is opened.

One or two rubber drainage tubes will be left in the wound to drain the cavity; these will need to be kept clean. It may be necessary to remove them occasionally so that they may be sterilized by boiling, or cleaned in a strong antiseptic. When they are put back in the chest wall they must be secured against being drawn into the pleural cavity by the movements of the ribs in respiration; even when very snug they will need to be secured by passing a large safety pin through them or fastening them with a stitch to the skin.

The pleural cavity should be flushed out with *normal salt* solution once or twice a day according to the amount of pus present. *Peroxide of Hydrogen*, one part to two or three of sterile water, may be used. If the *Peroxide* is of good quality, and the bottle has been opened but a short time, it will stand more diluting than if it has been opened a week or more; full strength may be used if the bottle has been opened some time. *Boracic acid*, saturated solution, may be used, or a weak solution of *Bichloride*, 1 to 10,000, or any other mild antiseptic.

If the visceral pleura has not been greatly thickened by the inflammatory exudate, the lung will gradually expand and fill the cavity; the suppuration will grow less and less, and in from two or three weeks to two

or three months the pleural space will have become obliterated and the condition healed. It will be necessary to keep the opening in the chest wall from closing until the suppuration has practically ceased. Hence, the necessity for the persistent use of the rubber drainage tube. This tube should be only long enough to reach through the chest wall into the cavity.

Sometimes the lungs fail to expand, with the result that the cavity will not fill up and the suppuration will continue, requiring thoracotomy for relief. Before resorting to any surgical measures some mechanical means to assist in expanding the lungs may be tried. One device consists of two bottles, each holding one or two quarts; the larger size is preferable. The corks should have double perforations; through these perforations well-fitting glass tubes are inserted. For bottle No. 1 one of the tubes should extend nearly to the bottom and far enough beyond the cork to attach a rubber tube, the other should only just enter the bottle and on the outside admit of attaching the rubber tubing. The long tube in bottle No. 1 is now attached by a rubber tube fifteen or eighteen inches long to one of the tubes in the other bottle. Another rubber tube with a mouth-piece is attached to the other glass tube in bottle No. 1; this bottle is now filled with water; the other bottle is placed four to eight inches above it. The patient by blowing into bottle No. 1 forces the water into the other bottle; this effort helps to make the contracted lungs expand. I have known some patients, who were seemingly at a standstill, to improve rapidly after beginning this treat-



ment. The amount of exercising required varies with different patients. It should not exhaust him or leave the lungs sore. It should not be repeated oftener than once a day the first few days.

If after a month or six weeks of treatment there is no improvement, some operative measure will be called for. The simplest operation for the condition is the removal of a section of three or more ribs. This will allow the chest wall to collapse and fill the space in the pleura.

When the parts have been thoroughly sterilized, a two or two and a half inch incision is made along the course of one of the ribs to be removed. This incision should extend through the soft tissues and the periosteum. The periosteum should now be separated from not less than an inch and a half of the bone. As a rule, the periosteum can be separated from the entire circumference of the bone without trouble. Some writers advocate removing the periosteum with the rib, so new bone will not form. They claim that the reforming of the ribs will draw them away from the lung. I believe the removal of the periosteum will seldom be necessary. The lung will have become attached to the chest wall before the new bone is formed, and if the ribs should straighten out, they will draw the lung with them. Besides, the operation is performed much easier if the periosteum is not removed. When the bone is freed of its periosteum an inch to three or four inches may be cut out with bone shears. By drawing on the skin it will slip on the underlying tissues until the cut lies over the adjacent rib. This rib is to be

cut down on and removed the same as the other. In this way as many ribs as desired may be removed through one or two incisions. The incisions in the skin should be closed and treated as clean wounds.

If the pleural membrane is greatly thickened, or the cavity is so large that it cannot be filled by this simple measure, some one of the severer operations on the chest wall will be called for. The discussion of these operations does not belong to this book. The after-treatment will not differ materially from that following the opening of the chest wall for empyema, or from other large wounds.

#### THE HEART AND PERICARDIUM.

Operations about the heart and pericardium will, in the main, require the same care as operations on the pleura and lungs. The patient should be kept as nearly perfectly quiet in both mind and body as possible. This will furnish a natural sedative for the heart. If the circulation should need some stimulation, care must be taken that it is not overdone, especially if the organ itself has been injured.

The local treatment will be the same as for other wounds in the chest. If there is suppuration in the pericardium, the irrigation should be made with gentleness. If *Peroxide of Hydrogen* is used, it must be weak, and the opening free, lest the rapidly developing gas embarrass the heart.

## CHAPTER X.

### MOUTH AND OESOPHAGUS.

**Mouth.**—Operations about the mouth are made with or without a preliminary tracheotomy, according to the diseased condition or the custom of the operator.

If breathing is carried on through a tracheotomy tube the back part of the mouth can be carefully packed during the treatment so that the discharges or solutions will be in no danger of entering the lungs or stomach. Thus protected, these viscera are not in much danger of infection and inflammation, even if suppuration is present. Mild antiseptics can be used safely to irrigate the wounds. The tracheotomy tube will require such treatment as has already been described. Some surgeons make use of the tracheotomy tube in all important operations about the mouth, or when troublesome hæmorrhage or sepsis is liable to be present. Others rarely resort to this measure, because they regard the opening of the trachea to be as serious, in most cases, as the difficulties it is intended to obviate.

If the trachea has not been opened and the wound is infected the patient should breathe through the nose and should avoid swallowing any of the secretions. Nothing should be used to irrigate the wounds that will be poisonous if swallowed.

**Hare Lip and Cleft Palate.**—Operations for these conditions are frequently made. The principal danger to be avoided in the after-treatment is the tearing out of the stitches. Crying or wrenching and vomiting are liable to cause damage, hence nothing should be taken into the stomach that will irritate it. The patient should be kept on liquid diet for at least four or five days, both to prevent vomiting and because it can be swallowed with less strain on the palate than would be occasioned by the swallowing of solid food. The mouth and nose should be sprayed once in three or four hours with a strong solution of *Boric acid* and *Calendula* one part to four.

If the patient is a small child that will be frightened and made to cry by the spraying it should not be repeated so often, for in these small children the principal danger to success is the crying. If the child cries in spite of careful attention, and the internal administration of *Chamomilla*, *Hypericum* or some other indicated remedy, a little opiate will be indicated. It will be the lesser of two evils. One-fourth grain of *Morphine* in a half glass of water, a teaspoonful once in one to several hours, will usually be sufficient. If the child is very young half a teaspoonful may suffice.

**The Tongue.**—Operations on the tongue are usually made for cancer. A part or all of the organ may be removed. If a considerable portion of it is left, the after care will consist simply in keeping the mouth clean. The *Boric* and *Calendula* spray, or some other cleansing solution, may be used.

If nearly all or all of the tongue has been ampu-

tated a thread is usually left attached to the stump, so that it can be pulled forward in case of hæmorrhage, or if the piece of tongue tend to drop into the throat, interfering with respiration. One of the chief dangers to guard against is secondary hæmorrhage. If the vessel cannot be caught easily the hæmorrhage may be arrested by Heath's method. He passes his forefinger down to the epiglottis, hooks it onto the hyoid bone, which he draws forward toward the symphysis menti. This stretches the lingual arteries sufficiently to control the bleeding. The cleansing of the mouth in these cases will be the same as in those in which only a portion of the tongue was removed. Carelessness in the cleansing might lead to septic pneumonia or gastritis.

What has been said will be sufficient guide in the care of other operations that may be made about the mouth.

**Œsophagus.** — While many different operations have been done on the œsophagus the only condition the after care of which seems to need discussion is stricture or conditions that might result in stricture. The treatment in these cases consists principally in the passage of bougies. These may be passed daily or at longer intervals, according to the condition present and to the amount of irritation that follows the treatment. If the tube has been sufficiently dilated during the operation, the treatment will consist in the passing of a full sized bougie only as often as it is necessary to prevent contraction. If there is trouble in passing the full sized instrument, as will often happen because of spasmodic strictures, a smaller size

should be used first, when the larger one will usually slip through the stricture easily.

The bougie should be warmed and oiled with some sterile oil or other agreeable lubricant. The patient should sit up with his head well extended. The point of the instrument should slip along the posterior wall of the pharynx into the œsophagus. Extreme gentleness will be required that no damage be done, especially so if the œsophagus has been weakened by disease or operation. The treatment should be continued as long as there is any tendency of the stricture to reform.

**Remedies.**—A few homœopathic remedies seem to have a specific action on the œsophagus, producing spasmodic stricture and inflammation. They will often be helpful during the treatment in allaying spasmodic conditions or in relieving the irritation due to the passage of the instruments. Among the most prominent of these are *Belladonna*, *Gelsemium*, *Phosphorus*, *Lachesis* and *Asafœtida*. The selection of the remedy will depend on the concomitant symptoms. *Arnica* will be needed if the passage of the bougie leaves the parts sore and bruised.

## CHAPTER XI.

### ABDOMINAL SURGERY.

We will first consider some general measures in the care of abdominal cases.

**Shock.**—These cases are especially prone to suffer from shock. For this reason the preparation of the patient for the operation should be as thorough as possible (see p. 17). All that has been said about the preparation of the room and bed (p. 28) should be observed. There should be some provision for heating the operating room, the temperature of which should be kept at about 80° F. An apparatus for the infusion of normal salt solution should be at hand (p. 40). The hypodermic case should be provided with *Strychnia*, 1–60 grain; *Nitroglycerine*, 1–100 gr.; *Atropine*, 1–100 gr.; and perhaps *Digitaline*, 1–100 gr. The attending physician or nurse should know how much of stimulating drugs or normal salt has been administered during the operation that the subsequent treatment may be carried out more intelligently. For the general management of shock, see p. 40.

**Vomiting** is always a distressing condition; it is doubly so when following upon an abdominal operation. The violent contraction of the abdominal muscles causes pain and sometimes does serious damage to newly united tissues. For these reasons especial care should be taken to have the stomach in proper condition for the anæsthetic, and

after the operation no suggestion of the possibility of sick stomach should be made to the patient and nothing should be swallowed that can in any way produce irritation. Even the position of the patient, whether upon his back, side or abdomen, will depend, to a large extent, on how it affects the stomach. I do not mean to convey the impression that patients often die, either directly or indirectly, from vomiting and retching. However, occasionally one does. The possibility, with the distress caused by this straining, makes it wise to take every possible precaution. For treatment see p. 32.

**Hæmorrhage** may result from the slipping of a ligature. Sometimes the blood pressure is so low during the operation that fair sized vessels bleed but little and are overlooked. After reaction increases the blood pressure, these vessels sometimes bleed profusely. The retching and straining of vomiting will sometimes cause a tearing out or slipping of sutures and ligatures and hæmorrhage results. Whatever the cause the condition should be promptly recognized and treated. If the patient is already suffering from the effects of shock or hæmorrhage that occurred during the operation, this intermediary hæmorrhage will simply show as an increase of the symptoms that are already prevailing. The pulse will become more rapid and weak, the respirations more labored and shallow, the pallor increased. The patient may swoon. This swooning may so lower the blood pressure as to temporarily check the bleeding.

As a rule, there will be a period of reaction before the hæmorrhage comes on. This period of reaction is



regarded as diagnostic. It should be borne in mind that the seeming reaction may be due to drug stimulation or salt infusion and the collapse be due to the natural limitation of the action of these drugs. An increased dulness in the region where the hæmorrhage would be possible will help to confirm the diagnosis.

As a rule, the treatment of this condition is surgical. If the operator is out of reach and the physician lacks confidence in his surgical skill, temporizing measures may be adopted, providing the bleeding is slow. A compress may be put over the bleeding part and the bandage tightened. Sometimes an ice bag will help. Heart stimulants should not be used except when the heart is liable to stop beating before other measures can be effective. Intra-cellular infusion of normal salt will be indicated. If the circulation is so weak that the salt solution will not be absorbed from the tissues, intra-venous infusion should be resorted to.

The stomach, in the majority of these cases, will not absorb anything that is taken into it, thus handicapping the physician in the use of internal remedies. There are some drugs that have a marked hemostatic action. *Hamamelis* tincture may be given in half to teaspoonful doses. It will sometimes act almost like magic in controlling internal hæmorrhage. Supra-renal extract, in its varied preparations, has a decided action on the vasomotor centres, causing a contraction of the capillaries. Some of the extracts of *Ergot* are prepared for hypodermic use and may be of value. I should not think of depending on the attenuated drugs in these cases unless the bleed-

ing be very slow or due to hemophilia. *Ipecac* and *Phosphorus* may be indicated in such cases and do them good.

If the bleeding continues in spite of these measures, or is rapid, the abdomen should be opened and an attempt made to secure the vessels. An eminent surgeon once said, "It is better to kill a patient in the effort to stop hæmorrhage than to allow him to bleed to death." This sounds heroic, but is correct teaching nevertheless. It amounts almost to criminal cowardice to allow bleeding to go on to a fatal issue because the physician fears that the thing to do to stop the hæmorrhage might endanger the life of the patient. The operating surgeon should be secured if possible. If he is out of reach the attending physician will have to open the abdomen, wipe out the clots, catch and secure the bleeding vessel. This work should be done with as much care against sepsis as was used during the primary operation. After the vessels are secured the abdominal wound should be closed and the usual dressing applied. If the vessel be caught with a forceps, but cannot be tied, the forceps should be left attached to it for thirty-six or for forty-eight hours. In such a case the wound can be partially closed and *Iodoform* gauze packed about the forceps. Sometimes it will be impossible to find the vessel, or there may be an oozing from a considerable surface. If so, an *Iodoform* gauze strip may be packed into the part so as to bring pressure on the bleeding surfaces. The end of the gauze should be brought out of the partially closed wound, so that it can be removed after forty-eight hours. Sometimes

it will be better to make an opening in the posterior vaginal cul de sac, draw the gauze through it and close the abdomen. The best course will be determined by the location of the bleeding. If the gauze is to be withdrawn through the vagina, the end should be drawn through from the abdominal side into the vagina. The portion within the abdominal cavity should be folded in layers in such a way that when traction is made on the vaginal end it will loosen and come out without tangling or knotting.

**Gas in the bowels**, or flatulence, has already been pretty freely discussed (page 73). I repeat here this caution: Do not put off the treatment until the pressure becomes distressing, but begin with the first indication that gas is collecting in the intestines. The enemata that would be given first can do no serious harm. If there should be some absorption, it will but furnish needed fluids to the tissues. The peristalsis can be much easier established, and the intestine cleared of gas before the abdomen becomes very much distended.

**Peritonitis** is one of the most dreaded of the complications that may accompany an abdominal case. Thanks to modern aseptic methods, the condition seldom arises except in cases in which there was pus in the abdomen before the operation; then the peritonitis may have preceded the surgery, as in advanced cases of appendicitis. When it develops secondary to the operation it is caused by the opening of an infected area and setting septic matter free in the abdominal cavity. Occasionally the septic matter is carried into the wound at the time of operation. Per-

fect technique on the part of the operator and all of his assistants is an ideal only attained after long experience, working together. An exceedingly slight slip may lead to the infection of the wound. These infections do not often cause more than a local abscess in the wound or about the cut tissues within the cavity. Occasionally the inflammation may extend to the peritoneum and set up a fatal peritonitis. It often happens that there are septic areas in and about inflamed tissue that have not yet broken down into pus; when these apparently clean areas are cut into the germs are freed and infect the peritoneum. Another source of infection is a leak in the intestine, due to ulceration or injury.

The severity of the peritonitis depends on the character of the infection and the amount of infectious matter present. If the germs are colon bacilli or staphylococci in small quantity the inflammation may not be fatal. Many pathologists believe that infection of the peritoneum with the streptococci is uniformly fatal. That such infection is usually fatal, all admit; that it is always so is doubtful.

The characteristic symptoms of this condition are bloating of the abdomen with extreme tenderness; coughing, sneezing or deep inspiration causes severe pain; the respiration may be very short because of the suffering that results from deep breathing; the limbs are usually drawn up to relax the abdominal muscles; the muscles are tense and board-like; there will be rapid and weak pulse. Sometimes there will be high fever, and again the temperature may be subnormal; the latter condition is rare, but the pulse is

generally increased in rapidity and weakness out of all proportion to the rise in temperature. The bowels may be loose; the usual condition, however, is constipation. The intestines may be completely paralyzed and all the symptoms of acute obstruction be present.

There are some variations from the type just described. If a large quantity of septic matter is let into the peritoneal cavity, as from the perforation of an intestine or an abscess, the patient may die from the absorption of toxic matter before the symptoms of active inflammation have time to develop. Again, the abdomen may be but slightly bloated or tender, even though there may be enough toxic matter absorbing to destroy the patient's life.

The condition that is most apt to be mistaken for peritonitis is distension from the development of gas in the intestines. It will not have the rapid pulse and the temperature will not be especially changed. There may be some traumatic fever that will not have subsided when the gas begins to collect in the bowels; but this fever is apt to be asthenic in character, the increased rapidity in the pulse being accompanied by a proportionate rise in temperature. Besides, the distention and pain will be of gradual development, while peritonitis is often ushered in by a chill. The passage of gas or a free movement of the bowels will relieve the distress temporarily if no inflammation is present.

*Treatment.*—If the peritonitis is due to a rupture of the intestine or an abscess so that septic matter is widely distributed, and is diagnosed at once, the treat-

ment is to open the abdomen, flush it out with normal salt solution and secure drainage. Of course, if there is a leak in the intestine, it must be closed. The normal salt solution should have a temperature of 105° to 110° F., and should be used freely. Some surgeons advocate a constant irrigation continued for several hours. The wisdom of following such a procedure depends largely on the surroundings and the ability of the attendants to preserve perfect asepsis. Another extreme class of surgeons advocate simply opening an abscess and allowing it to drain by keeping the external opening patulous. I have no doubt abscesses have often been delayed in healing by too vigorous treatment. If it is necessary to open the peritoneal cavity in order to get at the abscess, the pus should be wiped out thoroughly. If the infection is limited, the abdomen should not be irrigated, as the water might carry the infection to new areas.

In some cases the peritonitis is rapidly fatal and no other treatment than the surgical already outlined is of any avail. When the progress of the disease is slower, hot fomentations to the abdomen, if the patient can bear their weight, will give relief from the pain. The addition of a little *Turpentine* sprinkled on the under side of the cloths will be useful if there is much distension.

#### HOMŒOPATHIC THERAPEUTICS.

The Homœopathic Materia Medica is rich in drugs that have a marked action on the peritoneum. The following are a few of the most frequently indicated, with some of their leading symptoms:

*Belladonna* 3x is often the first remedy given. There is fever with a rapid, strong pulse; flushed face with possibly some delirium (the mind is usually clear in peritonitis); the abdomen is distended and sensitive to the least pressure or jar; vomiting may be persistent and the bowels loose.

*Bryonia alba* 3x follows *Belladonna*. There will still be the fever, but the pulse begins to weaken; there is great thirst; the abdomen distended and painful, the pain increased by the least motion; the bowels usually constipated. We think of *Bryonia* as belonging to the second stage of inflammation or stage of effusion.

*Rhus toxicodendron* 3x belongs more to the toxic variety or condition. It has extreme restlessness, the patient seems somewhat relieved by moving; the bed seems hard; the bowels are loose; pulse rapid and weak.

*Arsenicum* 3x.—This remedy is indicated in the septic cases. The pulse is rapid and weak; the thirst intense for small draughts of water frequently repeated, larger quantities cause nausea and vomiting; the stools are loose and passed involuntarily; the chief characteristic is the great prostration; the face is pale and shrunken.

*Lachesis* 12x to 30x resembles *Arsenicum* in many ways. The skin is more sensitive to touch, not necessarily painful, but sensitive. The parts about the wound are purplish in color.

*Terebinthina* 3x will be thought of when, with the distension of the abdomen, there is backache with irritation of the urinary passages.

*Mercurius* 3x is sometimes indicated in the later stages of the condition. The characteristic symptom is excessive sweating, which gives no relief to the patient.

*Echinacea* in 15 to 30 drop doses, repeated once in one or two hours, seems to have a general antiseptic action of considerable value. It is given by some prescribers in all septic cases, alternating with it the homœopathically indicated remedy.

Anti-streptococcic serum has seemed to give good results in some cases, but most writers have little confidence in it. If the peritonitis is known to be streptococcic in origin, it may be tried.

**Ileus.**—Acute obstruction of the bowels, due to peritonitis, has already been discussed. Ileus, as a postoperative complication, may be due to a twist in an intestinal loop, or to the obstructing action of adhesions. The obstruction may be complete or partial. The diagnosis will depend on the following conditions: inability to move the bowels; more or less severe pain in the abdomen; persistent vomiting, the dejecta finally being from the intestinal tract.

Treatment is to open the abdomen and relieve the obstruction. Sometimes a loop of the intestine will be found to be gangrenous. In such cases it will be necessary to make an artificial anus or an anastomosis. The discussion of these severe operations belongs to operative surgery.

**Bowels.**—If the bowels have not moved by the third day, either naturally, or from the action of the enemata that have been given to get rid of the gas, more vigorous measures to secure a movement should be used. See 'p. 58. The danger of a fecal mass



forming in the rectum is especially great after abdominal operations. The attendant should be constantly on the watch for this condition. Even when the bowels seem to move regularly and sufficiently, if there is the least complaint of a fulness in the rectum, a thorough digital examination should be made to determine the exact condition. I have known a physician to keep a patient on *Sepia* for a number of days for this "fulness in the rectum," when what was needed was to dig out an impassable mass of fecal matter.

**Care of the Wound—Redressing.**—The time for making the first redressing will depend upon various factors. If the wound is clean and closed without drainage; if the temperature and pulse keep normal after the reactionary fever subsides; if there is no developing pain or soreness in the wound, the dressing need not be changed for a week or ten days. As a rule, the non-absorbable sutures may be removed at this time. If they are irritating or cutting the tissues, they should be removed. If the stitches are causing no irritation and there is some tension on the newly formed scar, they should be left until the next dressing, a week later.

The patients sometimes follow just the opposite to this ideal course. At the end of two days to two weeks the temperature begins to rise, the pulse to beat more rapidly, or increasing pain and soreness may develop about the incision. The presence of any of these symptoms calls for an immediate redressing and careful inspection of the field of operation. The cause of the fever and pain will often be a localized inflammation or a developing abscess. In such

cases a larger or smaller indurated, painful mass can be outlined in or about the wound. If a stitch passes through this mass, it should be removed. Hot fomentations or glycerine clay poultices should be applied, and *Belladonna* 3x, or *Hepar sulph.* 30x or higher, given internally. With this treatment the inflammation will often subside without pus forming. If pus forms, you will have suppurative fever and stitch abscess. This topic is fully discussed, p. 52.

If drainage has been left in the wound, the time for the first redressing will depend on the cause for which the drain was put in and the amount of discharge that follows the operation. As soon as the dressings are soaked through, they should be covered over with dry cotton or gauze or the whole dressing changed. Bacteria cannot work through dry dressing, but can through moist. If the drainage was put in because of bleeding, it may be left two or three days, unless it is desirable to close the wound sooner. Then, twelve or twenty-four hours will suffice. As a rule, it will cause less pain to remove the packing at the end of the third day than at the end of the second. If the wound is clean, the lips should be sutured or drawn together with adhesive straps.

A convenient and effectual method of using the straps is to take two strips of surgeon's adhesive plaster, as wide as desired, and three or four inches long. To one end of each, two or three threads or pieces of tape are fastened. The plaster is then put on so that the edge with the tape will be from one to two inches from the edge of the wound and parallel with it—one strap on each side. When the threads are tied the lips of the wound will be brought together. These

straps can be used to hold the dressings in place when only a small amount of cotton or gauze is needed.

If there is active suppuration in the wound, the packing will need to be removed at the end of twenty-four hours. The dressing will need to be changed once or twice a day until the cavity is clean or closed up. The treatment will be the same as for a stitch abscess, p. 53.

**Sitting Up and Walking.**—Surgeons differ so greatly in their ideas of when it is safe for a patient to sit up or walk, that no directions can be given that will suit all. I will give my own custom. If the incision is in the median line or directly through muscles and fascia, and heals by first intention, the patient is kept in bed for three weeks. If the wound is in the upper part of the abdomen, he may sit up two or three days earlier. By the middle of the fourth week, he can begin to walk. If the patient is in the hospital, he can go home at the end of the fourth week unless the journey is very long.

If the incision follows the muscle splitting plan, as McBurney's incision for appendicitis, the patient can sit up in two weeks and go home in three.

When there is suppuration in the wound the patient should not be allowed to sit up until the healing is complete, or so nearly complete that only a small, shallow sinus remains.

Of course these rules refer only to the condition of the wound. There may be cases in which the scar does not seem firm and a longer confinement will be required. Again, the general health of the patient may make it necessary for him to remain in bed much longer than two or three weeks.

## CHAPTER XII.

### SPECIAL OPERATIONS WITHIN THE ABDOMEN.

**Stomach.**—After the various operations on the stomach, aside from the general measures already discussed, the principal care will be in regard to the feeding. Some writers advocate giving of small quantities of water soon after the operation, and liquid food at the end of thirty-six or forty-eight hours. Most surgeons prefer to keep the stomach entirely empty for four days, supporting the patient with nutrient enemata. I should lengthen the period rather than shorten it. If the patient is very weak and does not seem to be benefited by rectal enemata, stomach feeding should be resorted to earlier rather than have the patient die from want of nourishment. Solid food should not be given for three or four weeks.

After gastrotomy only liquids can be taken. Sometimes the patient can thoroughly masticate solid food so that it can be passed through the tube into the stomach. There would be some advantage in this method, as the food would be mixed with saliva.

**Liver.**—Operations for cysts or abscesses of the liver need no special directions. If they are drained they will need the treatment ordinarily given when drainage is left in the abdomen, p. 143.

When the gall bladder or ducts are opened and drained the flow of bile usually presents some diffi-

culty. If it is not too thick from the admixture of mucus it can be drained through a tube attached to the drainage tube and collected in a bottle at the side of the bed. It will drain better if the bottle is considerable lower than the patient. When it will not run through a small tube it will be necessary to catch it in the dressings. If all the bile passes out through the fistula, the dressings will have to be changed quite frequently. Cloths or towels that can be washed out will do as well as fresh cotton or gauze and will be much cheaper.

The time for the removal of the drainage tube will depend on the condition of the bile. If it is free from pus or mucus the tube can be removed in two or three days, or as soon as the adhesions effectually wall off the abdominal cavity. If mucus or pus is present the gall bladder must be drained until the bile is clear. In such conditions it is my practice to irrigate the gall bladder daily with normal salt solution. If there is no obstruction to the passage of the bile into the intestine, the fistula into the gall bladder will close in from one to six weeks after removal of the tube. Occasionally the fistula will remain open for a longer period and still heal spontaneously. The application of *Silver nitrate* caustic will often hasten the healing. If the fistula does not heal and there seems to be no obstruction in the bile ducts the sinus should be dissected out and the wound closed with sutures.

The adhesions between the gall bladder and the abdominal wall cause pain in a small per cent. of cases. When this complication exists an operation to

relieve the adhesions will be called for. Such an operation should be undertaken only by a surgeon of experience, for unusual difficulties are often caused by adhesions.

**Intestines.**—After any operation in which the intestine is cut the diet should be restricted to liquid food for three weeks. If the operation is on the small intestine, the same plan of feeding may be followed as after operations on the stomach (page 145). If the operation is on the colon, enemata should not be given. Liquid food may be taken by the stomach. When it is necessary for the bowels to move the stools should be made liquid by taking oil or salts. The bowels should not be confined more than a week; some surgeons advocate the moving of the bowels the third or fourth day.

When an artificial anus is made and the bowel has once been thoroughly evacuated the diet should be such as will tend to keep the stools reasonably solid (see diet lists). With the stools solid a band and pad can be worn that will usually control the movements. If the parts about the fistula are not kept scrupulously clean, the skin will become irritated and sore. The use of vaseline may protect the skin from the irritating discharges.

If the artificial anus is made because of some temporary condition, as ileus, it should not be kept open after the obstruction is cured. It will often close spontaneously as soon as the efforts to keep it open are relaxed; if it does not, an entero-enterostomy will be required.

Fecal fistulæ sometimes occur after operations for

appendicitis or anastomoses of the intestines. The only treatment that will be called for in most cases will be to secure free drainage, so that the fecal matter will not be retained in a pocket, and to keep the parts as clean as possible. The treatment should be about the same as for an abscess. These fistulæ will usually close spontaneously in two or three days to a month or six weeks; a few cases will require operations.

**Appendectomy.**—As has already been mentioned, appendectomy is sometimes followed by a fecal fistula. Its care is discussed in the preceding paragraph.

Appendicitis often results in an abscess. After operation these cavities have to be drained. Sometimes they are slow in healing, and an unclosed sinus may persist for weeks in spite of the best of care. At the time of operation these cavities are usually packed full of gauze. At the subsequent dressings only enough gauze should be put in to secure good drainage. As the inflammatory exudate absorbs, the intestines will expand and fill the space occupied by the pus; the packing should not prevent this. Strips of gauze should be put in lightly, but should reach to the bottom of the cavities so that small pockets will not be left unhealed. Such pockets will be filled by granulations if they are sterile; if they are not sterile, abscesses will form. The suppuration will cause some fever. If the pus can be located, the abscess should be opened. It will usually open spontaneously before its exact position can be determined.

The tendency will be for the opening in the abdominal wall to close and thus prevent drainage and heal-

ing below. This is often the cause of the persisting sinus. The opening should be dilated, or enlarged by incision if necessary. Another cause of persistent sinus may be an infected concretion or an ulcerating appendix. In these abscess cases it is often possible to only evacuate the pus and partially clean out the cavity. If the appendix is not removed, it will sometimes slough out or its cavity be obliterated by granulations. At other times, because of its position or the presence of a fecal concretion, it keeps up a suppurating process. Such a case can only be cured by removing the cause surgically.

These sinuses sometimes persist because of anæmic condition of the tissues. The cells cannot overcome the bacteria and their toxins. In such cases swabbing the sinuses with pure *Carbolic acid* or a strong solution of *Silver nitrate* will not only kill the bacteria, but will often stimulate a more vigorous and healthy action in the cells. If the sinuses are not deep and the medicine comes in contact with every part of their wall, they should be dressed with a surface dressing after the use of the caustic and left for several days without treatment; they will often be found completely healed when the dressing is removed. Any other local measures used in treating abscesses will be indicated in these conditions (see page 53).

#### HOMŒOPATHIC THERAPEUTICS.

Besides the remedies given for suppuration, page 54, *Silicea* 30x should be studied. It has many symptoms similar to *Hepar sulphur*. I have found it to follow the latter remedy when the thick, creamy pus



gives place to a thin, ichorous discharge; there does not seem to be vitality enough in the tissues to produce healthy granulations. The potencies from the twelfth up are most in favor.

*Sulphur* (high) has many symptoms that may be found in these cases, in fact, according to the *materia medica*, all the symptoms. I have thought it must be a queer symptom that this drug has not produced. In addition to its specific action in suppurating cases it is potent in a way that we can make use of. When the patient ceases to respond to the indicated drug a few doses of *Sulphur* will so change the condition of things that the remedy will again become effective.

**Hernia.**—As a rule, operations for hernias are clean, and the treatment is the same as for any clean wound (page 142). An exception to the rule exists when the hernia becomes strangulated and gangrene of the intestine results. This not only gives us an infected wound, but the case is complicated by the necessity of making an entero-enterostomy, or an artificial anus. The treatment for these complications has been considered on page 147. When the wound is infected from any cause the treatment should follow the general plan for septic cases (page 51).

After operations for the radical cure of hernia the patient should remain in bed three weeks. If the hernia is very large or the tissues much atrophied, he will need to stay in bed a week or two longer. Some surgeons keep all their patients in bed for a longer period. Three weeks is the rule with most surgeons for uncomplicated cases.

Surgeons differ regarding the wearing of a truss:

some advocate them, others condemn them. The latter claim the truss will cause atrophy and stretching of the scar tissue. My patients do not wear trusses after their operations; they sometimes wear a gauze pad held in place by a well-fitting T bandage. Patients should refrain from heavy lifting or work that would make much strain on the abdominal muscles for three or four months after getting on their feet.

## CHAPTER XIII.

### UTERUS, TUBES AND OVARIES.

The general discussion of the after care of abdominal cases covers the treatment of abdominal operations on the female pelvic organs, barring complications, whether it be a pan-hysterectomy or the removal of only a portion of the adnexa. In fact, most of the complications that may arise, as shock, hæmorrhage, suppuration of the wound, etc., have been discussed.

A suppurating sinus sometimes persists after a ventral suspension of the uterus. The cause is usually a non-absorbable suture that has been used to anchor the organ. The stitch having become infected, the sinus can only be healed after it is removed. A non-absorbable buried suture used in closing the abdominal wall may become infected, cause a sinus, and require the same kind of treatment. There are three ways of getting rid of such a suture: Let it slough out, try to hook it with a small blunt hook and pull it out, or enlarge the sinus. The operation is, as a rule, simple. With a grooved director in the sinus to direct the knife, the opening can be enlarged until the stitch can be seen in the bottom of the wound and removed. If the sinus is made aseptic, it should be closed and treated as a clean wound. In most cases the wound should be left open a few days, or until it is certainly aseptic, when it may be sutured. If the wound is small, it may be left to heal by granulation.

Occasionally suppuration takes place along the line of incision in the broad ligament. This is a rare complication, but when it does occur it causes no end of anxiety and annoyance to the attending physician. The general symptoms of suppurative fever will be present (page 52). The focus of the trouble may be hard to locate. With the indications of suppuration present, and yet, with no indication of confined pus in the abdominal wound, a thorough vaginal examination should be made. If the pocket is found, it should be opened through the vagina and cleaned out (page 53). An anæsthetic may be necessary to make the examination sufficiently thorough. These abscesses are usually small, and open spontaneously before their presence is really suspected. If they are large, they should be freely opened under an anæsthetic and the cavity drained with gauze or rubber tube. If gauze packing is used, it may be left in place twenty-four hours, when it should be removed, the cavity irrigated with *Peroxide of Hydrogen* and *Creoline*, or some other antiseptic, and re-packed. This, and subsequent packings, should be light, simply to secure good drainage; the packing should be renewed every day. If a rubber drainage tube is used, little packing, if any, will be needed after the first dressing. Some surgeons simply wipe out the abscess, not using any antiseptic.

When the suppuration is slight and the symptoms subside as soon as the abscess breaks, daily vaginal douches of *Creoline*, 1 to 100, will be sufficient local treatment. For internal medication, see page 54.

After these gynecological operations the family

## 154 BEFORE AND AFTER SURGICAL OPERATIONS.

physician should be informed, either by the operator or through the family, of just what was done at the operation. An attending physician may be greatly handicapped in the treatment of a case if he supposes both ovaries were removed when a portion of an ovary was left.

Other operations are made on the abdominal viscera. They will seldom present difficulties the treatment of which has not already been discussed.

## CHAPTER XIV.

### THE GENITO-URINARY ORIFICES IN WOMEN.

**Vaginal Vault.**—Several operations are made on the uterus and adnexa through the vaginal vault. The care of these cases will require digital and instrumental examinations, the packing of cavities, and douching. After operations it is essential that no infection be carried to the wound during these examinations and treatments. It is not sufficient that the vagina is clean, the vulva and parts about should be sterile. Enough importance attaches to this point that special directions regarding the position and preparation of the patient will be in order.

The best and most convenient position for the operator would be to have the patient on a table, the knees drawn up and the buttocks at the edge. In most homes it will be difficult to get this ideal position. The bed can be arranged to make a very good substitute. A couple of table boards or other wide boards can be put crossways of the bed, so that the front ends catch on the bed-rail; the back end should be raised a little so that the fluids will flow away from the patient into a receptacle at the side of the bed. A Kelly pad will be very convenient in these cases, but is not essential. A rubber or oilcloth sheet can be put under and about the patient in such a way as to carry the water away from her and the bed. The patient lies on her back with her hips well over the

edge of the bed and her feet in chairs at either side of the attendant.

When the patient is in position the vulva and parts about should be scrubbed with soapsuds and rinsed off with some antiseptic solution. A *Creoline* or other mild douche should be given, when the patient will be ready for any examination or treatment. The instruments should be boiled and the attendant's hands scrubbed and sterilized as for a primary operation. The physician who is used to making examinations and using instruments that are merely clean, might be careless of these details; he might even feel that they are unnecessary. It must be remembered that we now have raw and injured tissues in the vagina, and that germs carried to these tissues will be very liable to cause inflammation and suppuration.

If the patient has a bed-pan, she can have her douche without changing her position in bed, and thus be prepared for a simple digital examination.

The diet will follow the general directions (page 56).

The bowels should be moved the second day with an enema, and should be evacuated as often as once in two days while the patient remains in bed. If the bowels do not move sufficiently by these means, and none of the remedies for constipation (page 62) relieves the condition, a laxative should be given.

The catheter must be used as long as there is packing in the vagina, unless it be a small piece of gauze that does not separate the lower vaginal walls. As soon as the packing is removed the urine may be passed naturally. An exception should be made to this rule: When the perineum has been injured so

that the vulva remains open if the patient lies on her back, it should be drawn until the patient can sit up. If it is not drawn, it will run back into the vagina and infect the wound.

#### TRACHELORRHAPHY.

This is the most common operation in this class. Most surgeons put in a gauze pack at the time of the operation; this should be removed in two or three days. After the packing is removed the treatment will consist of a daily douche with a mild antiseptic solution or sterile water. If silk, silkworm gut or silver wire stitches are used, they will have to be removed in ten days or two weeks. The patient can sit up after the stitches are removed.

#### VAGINAL HYSTERECTOMY.

The general plan of treatment for uncomplicated cases of vaginal hysterectomy will not differ from that for trachelorrhaphy. The details will be worked out a little differently. The packing should be left in three or four days. If there is no discharge, a new packing may be put in and left for two or three more days. After this the packing may be left out and daily douches given. The patient should stay in bed for at least three weeks. She should do no lifting for six or eight weeks after she is able to be on her feet.

If there is some purulent discharge, a daily douche of *Creoline* or other non-irritating antiseptic should be given. If there is decided pus, the wound should be examined through a speculum to determine whether



it comes from the raw surface or from some pocket; if from a pocket, and it lacks good drainage, the opening should be enlarged. *Peroxide of Hydrogen* should be used both on the raw surface and in the pocket. If there is a rise of temperature that indicates a pocket of confined pus, and an examination shows it to exist, or if the pocket is open but does not drain well, and the temperature continues high, the patient should have an anæsthetic that the pus cavity may be thoroughly opened and gently curretted.

**Complications.**—There is often a bloody discharge following these operations that is of no especial significance. It is composed of serum and mucus stained by the clots that were left at the time of the operation, or by some oozing from the wounded tissue. It may be quite profuse for three or four days, and then gradually lose its bloody color or cease entirely. Its presence will make extra precautions necessary to prevent the wound becoming infected. The pads should be changed as often as they become soiled, and the vulva and parts about should be kept clean and sterile.

*Hæmorrhage.*—Sometimes a real hæmorrhage occurs after a vaginal hysterectomy. It may come on within a few hours, attending the reaction from the shock; or it may come at the end of ten days or two weeks as a secondary hæmorrhage. If the bleeding is at all profuse, it is a serious condition and will require immediate surgical treatment. This treatment will be to secure the bleeding vessel and tie it, often a difficult task. The patient should be anæsthetized and put on a table in a good light. When the clots have been removed systematic search should be made

for the bleeding point. By catching the lower portion of the broad ligament it may be drawn down so that a forcep can catch higher up; by gradually working up, the ovarian artery will finally be brought into view and caught; it is usually the offending vessel. The chances are that it will be better to leave the forceps in place than to try to tie the vessel; the forceps may be removed in forty-eight hours. Sometimes it will baffle a skilled surgeon to find and secure the bleeding point. A persistent effort should always be made, as the bleeding vessel is sometimes quite superficial and easily secured. When the vessel cannot be secured and the bleeding is not very rapid, *Iodoform* gauze may be packed against the bleeding area; this packing should be held in place by a vaginal tampon from below and a compress and binder over the hypogastrium; it may stop the hæmorrhage. The patient must be closely watched as the firm vaginal tampon may prevent the blood showing externally while it is accumulating in the abdominal cavity. If the bleeding still continues, or if the vessel is so large that it is unsafe to temporize with packing, the abdomen should be opened and the artery secured. This may require as difficult an operation as the first one, and an experienced surgeon should be secured to perform it if possible. If a surgeon is not available, the attending physician would be warranted in taking desperate chances rather than sit by and allow his patient to bleed to death. It is to be understood that whatever is done a strict aseptic technique should be adhered to.

*Urinary or fecal fistulæ* occur as a result of wound-

ing of the bladder, or more frequently from the cutting off of an ureter and from wounding of the bowel. One patient came into my clinic who had both a fecal and a urinary fistula following vaginal hysterectomy. The right ureter was cut off some distance from the bladder; the sigmoid was cut half in two at about its middle portion. Such results would hardly be counted good surgery, yet injuries have been made to these organs by men of the highest repute. More often fistulæ result from the ulcerating through of cancerous tissue where the disease has extended to the bladder or rectum from the uterus.

If the openings into the viscera are not too large, they will close spontaneously if the parts are kept clean and the urine or feces drain away freely. Touching the edges of the fistula with *Silver nitrate*, if the granulations become exuberant or anæmic, will sometimes hasten their closure. The discussion of operations for the closure of these fistulæ belongs to treatises on general surgery.

*Suppuration* should be regarded as a complication in these cases. The treatment has already been discussed.

*Prolapsus* of the vagina sometimes follows removal of the uterus for precedentia; its treatment belongs to surgery, not the after care.

**Pelvic abscesses** are often opened through the vagina. These abscesses are very extensive at times, and the care of the case after they are opened requires skill and patience. The tendency will be for the opening through the vaginal wall to narrow up so as to interfere with drainage and treatment. The treatment

will consist in daily cleansing the cavity with *Peroxide of Hydrogen* followed by *Bichloride* 1 to 4,000, or some other antiseptic. After the irrigation the cavity should be packed with gauze or drained by a good-sized drainage tube. The packing should not be put in tight enough to prevent the walls of the cavity collapsing or the granulations from filling it up. The constitutional treatment will follow the line already discussed (page 54) for suppurative conditions.

A **vesico-vaginal fistula** is sometimes made for supuration in the bladder. There are two points in the after care of these cases that need special mention: The bladder and vagina should be irrigated with some antiseptic, as *Permanganate of Potash*, 1 to 2,000 or 4,000; the fistula should be kept open until there is no evidence of pus in the urine. In some cases the fistula will close as soon as treatment ceases. Irritating the edges with *Silver nitrate* once in four to seven days is useful in some cases; others require an operation to close the artificial opening.

Internal medication is needed to meet the conditions within the bladder. The remedies are discussed under the topic Cystitis, page 69.

#### VAGINAL ORIFICE.

**Perineorrhaphy.** — Among the operations at the vaginal orifice, perineorrhaphy is the most important and the one most frequently made. The location of the wound makes it difficult to prevent infection. The old custom of tying the knees together is only resorted to at present when the patient is very restless and throws herself about. The local dressing

consists of antiseptic pads. These pads are made by folding a piece of sterile cotton in a piece of sterile gauze; they are held in place with a T bandage and changed as often as they are soiled.

The *urine* must be taken with the catheter for four or five days. A glass catheter is the best for this work; it should be boiled each time before using. The meatus should be cleaned with a piece of gauze moistened with *Creoline* or other antiseptic. If the urethra becomes irritated so that the catheter causes severe pain when passed, the patient can turn over on her face and pass the urine naturally. With proper gentleness the use of the catheter will cause less annoyance than such marked shifting of position. When the patient begins to void her urine the perineum should be cleansed after each micturition.

The presumption is that the uterus and vagina were left clean and sterile at the time of the operation. If there should be any suspicious discharge, the vagina should be irrigated with some mild antiseptic three or four times a day until the perineum is completely healed. The vagina should not be irrigated during menstruation unless the flow is accompanied by a suspicious leucorrhœa. The vulva and skin surface about the perineum should be kept clean and sterile. There will be more danger of infection from these parts than from the vagina.

The *bowels* should be moved in two or three days. In most cases it will be best to give a laxative, and, when the bowels feel like moving, an enema of soap-suds or oil. If the operation was for complete laceration of the perineum, some operators would confine

the bowels for two days longer. I prefer that there should not be too large an accumulation. In any case, the first two or three times that the bowels move the nurse should support the perineum during the movement.

If an *abscess* forms, it should be treated the same as an abscess in other parts (page 53). The pus should, if possible, be evacuated without cutting the deep stitches.

The *stitches* should be removed in ten days to two weeks.

A **vulvar abscess**, or cyst, if it is simply incised, will need more persistent packing and treatment than other abscesses. As a rule, the better treatment for them is to remove the whole gland, carefully dissecting out the lining membrane of the cyst or abscess.

## CHAPTER XV.

### THE RECTUM AND ANUS.

**Hæmorrhoids** are operated on by different methods. For our purpose we will consider them in two classes; those in which discrete tumors are removed and those in which the mucous membrane covering the entire circumference of the sphincters is sacrificed.

But little treatment is required, as a rule, after the first class. Some surgeons put a plug of gauze in the sphincters to check any oozing that might be present: This plug may be left in place for twelve hours, but it will usually have to be removed in four to eight hours because of the severe pain it occasions. The pain following these operations may be very severe. If the sphincters were not thoroughly divulsed, the irritation will cause spasmodic contractions that will make the patient swear if he knows how. These pains may last twenty-four or forty-eight hours. Hot fomentations to the anus may give some relief. Remedies like *Belladonna*, *Nux vomica*, *Cuprum* or some other anti-spasmodics may be tried; I never saw any positive results from their use. One-fourth grain of *Morphine*, hypodermically, will be required in some cases to relieve the pain and give the patient needed rest.

The bowels should be moved the second or third day. A laxative should be given, to be followed by an injection as soon as there is any desire for stool. After the first evacuation the bowels should be moved

every other day. After a movement the parts should be cleansed with sterile water; this cleansing may be followed by an ounce of *Calendula* and water (1 to 4), or *Hydrastis*, the same strength.

At the end of ten days or two weeks, if there is any soreness remaining, the bowel should be examined with a speculum to see if the wounds are perfectly healed. If there are any sore spots, they should be touched with a solution of *Silver nitrate* or *Iodine* to stimulate the indolent granulations. Unless there is some dyscrasia these wounds will heal promptly. If there is a constitutional taint of any kind, the indicated remedy should be carefully sought and given. Cases that were unaffected by internal remedies while these orificial irritations were present will oftentimes respond in the most surprising manner after they are removed.

The patient should usually stay in bed one to two weeks, according to the severity of the operation.

What has been said will also apply when the entire surface of the sphincter portion has been removed; but in these cases some additional directions will be needed. Dr. Graham, of Rochester, N. Y., recommends drawing the nates apart until the entire line of sutures connecting the mucous membrane and skin edges is exposed; he then tucks in a bit of gauze moistened with *Calendula*; this dressing is renewed every four hours for four or five days. This extreme care will secure union by first intention in most cases.

Another point in the after-care of these cases that I wish to emphasize is this: The scar tissue that forms, whether little or much, is liable to cause constriction



of the opening or interfere with the free, natural action of the sphincter. This condition must be met by stretching the sphincters. In some cases it may be necessary to give an anæsthetic in order to sufficiently divulse the sphincters to overcome the stenosis and secure a healthy action of the bowels. I knew one case in which this treatment had to be repeated four times, combining with the stretching, nicking of the scar tissue in several places. The final results were excellent, not only relieving the man of the piles, but also of chronic rheumatism that had made him almost a helpless invalid for two years. As a rule, all the dilating that the sphincters will need can be done without an anæsthetic. These cases should be kept under observation for two to three months at least. I feel sure some cases that have seemed to be worse than failures could have been made brilliant successes by proper after treatment. This is especially true when remote or reflex conditions are sought to be relieved by operation.

Incontinence of *feces* sometimes results from clumsiness of the sphincter, due to the scar tissue. Such cases can be relieved by the stretching spoken of. Other cases are due to partial or complete rupture of the sphincter muscles. If the rupture is partial, gentle stretching of the muscle (massage) and electricity may help the condition. Prof. Pratt claims that the incontinence is not so much due to the rupture of the muscle as the way the muscle is dragged out of place by the mucous membrane or scar, and that it can be relieved by proper surgical treatment. The discussion of such operations belongs to other books.

**Fistula in Ano.**—When the fistulous track is laid open and left to heal by granulation, the dressing should be made every day. The track of the fistula should be packed with gauze. The wound should be inspected the entire length to see that no bridge heals across the wound, the upper portion remaining unhealed and fistulous in character.

**Excision** of the rectum for cancer or stricture is one of the rarer rectal operations. As a rule no effort is made to save the sphincter. There will be incontinence of feces, and the after-care will be principally directed to keeping the parts clean. Diet that will tend to keep the stools solid (page 94) will be of first importance. The cul-de-sac left by the removal of the rectum, will need to be packed with gauze. The packing should be removed and the parts cleansed as often as necessary to keep them clean. It may be three or four or more times a day. The packing should not fill the whole lumen, but rather the pockets, leaving an opening through for the passage of gas and feces. When the pockets are healed, and only a fistulous track remains, the packing need not be put in.

**Prolapsus** of the bowels is treated by various methods. If the prolapsed portion is amputated at the anus, the treatment will be the same as for operation for piles when the entire mucous lining of the sphincter is removed. (Pratt and Whitehead operations.) If one of the intra-abdominal operations is made, the treatment will be the same as for other clean abdominal operations.

## CHAPTER XVI.

### KIDNEYS AND GENITO-URINARY ORGANS.

**Preparations.**—Some special preparation of the patient will be needed for the more important operations on the genito-urinary organs.

If, during the operation, any part of the tract is to be opened in such a way that urine will come in contact with the cut tissues, or be extravasated subsequently, *Boric acid*, *Salol* or *Urotropin* should be given in 5 grain doses, repeated three or four times a day. Any one of these drugs will make the urine antiseptic enough to prevent the growth of bacteria. If the urine contains pus, the drugs should be given a week prior to the operation if the surgery can be deferred that length of time.

If the operation is to involve the bladder, the viscus should be irrigated with *Permanganate of Potassium*, 1 to 2.000 or 4.000, in addition to the administration of the urinary antiseptics. If cystic calculus or ulceration is the condition for which the surgery is to be done, the irrigation should be repeated twice a day for a week or more.

Extra pains should be taken to secure good elimination from the kidneys. See p. 21.

If nephrectomy is contemplated, not only the presence of another kidney, but its condition must be determined. This can be done by ureteral catheterization, by the use of a Harris segregator or some

other like instrument. Unless one is an expert in bladder examinations it will be practically impossible for him to catheterize the ureter, especially in the male. The segregators are instruments with which the urine from each side of the bladder is collected separately. The knowledge gained with them is not so exact as that from ureteral catheterization, when the latter method can be used. However, they are so much easier managed, any physician who has a little mechanical skill, can use them. They will, in the majority of cases, give him a sufficiently accurate knowledge of the eliminative capacity of each kidney. With some cases the desired knowledge can only be secured by a laparotomy. This operation will usually be made at the time of the nephrectomy.

Extirpation of the kidney is sometimes made through the anterior abdominal wall. This operation presents no special features in its after-care, hence it was not referred to when discussing abdominal surgery. The operations on the kidney are usually made through a lumbar incision.

All of these operations are followed by considerable pain. *Morphine* should only be given when hot water bags or bottles about the part have failed to relieve, and the suffering is injuring the patient more than the opiate would. The reason for withholding the opiate is because of the action of *Morphine* on the kidneys. It has a tendency to suppress the urine, and after such operations might produce uræmia.

**Nephropexy.**— After most of these operations the patient should lie on his back or the side operated on. This will secure drainage if desired. This position

is especially important after nephropexy. The patient should not be allowed to turn on the opposite side for ten days or two weeks. If the abdominal wall is very much relaxed, a bandage with a pad over the kidney may give some comfort and help to hold the kidney in place until the adhesions are firm. Such a bandage may be worn two or three months.

**Perinephritic abscess** is of quite frequent occurrence. It is often due to infection extending from a diseased kidney. After it is opened, it should be treated the same as any other abscess. If the cause of the abscess has been removed at the operation, it will act like other abscesses. If some dead bone, or a calculus from the kidney, or an ulcerating appendix remains in the depths of the sinus, it will not heal. Or, if it does, it will break out again. The same will be true if there is an opening in an intestine that fails to close. Such conditions will require subsequent operation.

For suggestions regarding internal remedies see page 149.

**Nephrotomy** is an operation that is usually made for renal calculus or abscess. The kidney may sometimes be cut into when there is no infection. In such cases, it may be sewed up, the wound closed and treated as a clean wound. More frequently, a drainage tube will be needed. The drainage tube should not be removed until the discharge from the kidney is practically sterile. Before and after the tube is removed, the sinus should be cleansed with *Peroxide of Hydrogen*, and irrigated with *Normal salt solution* or *Permanganate of Potash* 1 to 3,000 or

4,000. If the ureter is patulous and the kidney is not tuberculous, or there is no other incurable condition present, the sinus will close in a few days to a few weeks after the removal of the tube. If such incurable conditions are present, a urinary fistula will probably remain until the kidney is removed.

**Nephrectomy.**—In this operation the wound may be closed or drained. In either case, what has been said for nephrotomy will apply here. If the diseased kidney has been functionless or nearly so, and the other kidney is excreting nearly the normal amount of urea and other urinary solids, the treatment will present no features different from any other wound. If the kidney is removed because of a traumatism, or while it is still excreting considerable portion of the urine, the diet must be regulated so as to contain a small proportion of proteids, and the patient must avoid any active exercise until a compensatory hypertrophy has taken place in the remaining kidney.

#### BLADDER.

**Lithotrity** is performed much more frequently on the male than on the female. The shock that may attend the operation should have the usual treatment for shock, page 40. Suppression of urine is a complication that will be met with occasionally. For treatment, see page 67.

**Cystotomy** may be performed for the removal of a large calculus or other foreign body from the bladder; to drain, in case of cystitis; or for the removal of an enlarged or diseased prostate. Whether the operation is suprapubic or perineal, a drainage tube will

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usually be left in the bladder. This drainage tube should be kept in place until the urine is free from pus. The fistula that remains after the removal of the tube will usually close in three or four weeks. If the patient is tubercular or has very low vitality, or if there is stricture of the urethra, it may not heal. Properly selected internal remedies for these depleted constitutions will help in securing resolution. Operative measures will be required in some cases. If stricture is present, it will need to be cured surgically. In some instances operation for the direct closure of the fistula will be successful.

### PENIS.

Not many operations are called for on the penis, but some of these are made frequently enough to make this an important organ to the surgeon.

**Circumcision** is one operation that there is little danger of being done too frequently. The treatment after this operation will seek to keep the parts clean rather than aseptic. The necessity of urinating will make it impossible to protect the parts against possible infection. However the tissues heal so rapidly that serious infection will only result from gross carelessness on the part of the patient or nurse. If the incision is not protected with *Collodion* or other material that seals it, the penis should be washed off with some mild antiseptic after each micturition. Some sterile gauze or cotton should protect the wound from the cloths. If the penis is thus protected, the patient will not need to remain in bed after he has recovered from the effects of the anæsthetic.

A small child will sometimes resist the desire to urinate. Except in very rare cases he will yield before any damage to the bladder is done. Occasionally the operation may cause a paralysis of the bladder, thus preventing micturition. In such cases *Belladonna* or *Gelsemium* should be given internally and hot moist cloths applied over the hypogastrium. If these measures fail to start the urine a catheter must be passed.

Edematous swelling of the prepuce will do no harm unless the opening in it is left too small and it is allowed to retract above the glans penis. With such complication it would cause serious constriction of the swelling glans. If it cannot be pushed back through the opening, a grooved director should be slipped under the foreskin on the dorsum of the penis and the constricting portion cut as in paraphimosis.

Non-absorbable stitches should be removed in five days to a week.

As soon as the wound is healed the foreskin should be thoroughly retracted in order to break up any adhesions between the prepuce and the glans penis. This process should be repeated once in three or four days as long as there is any tendency for the adhesions to form.

**Urethral Strictures.**—Operations for stricture of the urethra will not be successful in many cases if they do not have after treatment. The irrigation of the urethra with *Permanganate of Potash*, 1 to 2,000 or weaker, or some of the silver preparations, will be useful after cutting operations. The internal administration of *Boracic acid*, *Salol* or *Urotropin*, three or



four times a day, will sterilize the urine and will help to prevent infection of the wounded urethra. Any one of these drugs may be given in 5 grain doses. But the after treatment that I refer to is the dilatation of the urethra. Sounds, as large as the normal caliber of the tube, should be passed at lengthened intervals for from six months to two years. In some cases the tendency to recurrence of the stricture will continue while life lasts. Such patients will never be able to entirely dispense with the use of the sound. What is meant by "lengthened intervals" is this: A sound should be passed one week from the time of the operation; again, in two weeks; then, in one month; and so on, doubling the intervals if there seems no tendency to recurrence. If there is a narrowing of the urethra, the sound should be passed at shorter intervals for a time. A stricture that seems entirely cured at the end of a month's treatment may show a decided narrowing if left for six months. If untreated it will be liable to produce the whole train of diseases that strictures are responsible for: Cystitis, fistula and nephritis.

#### SCROTUM.

There are three operations that are frequently made because of disease of the scrotum or testicle: Incision for hydrocele or abscess; removal of varicose veins, and castration. The care of the wound will be the same in all cases. If a drainage tube is used it should be removed in twenty-four to forty-eight hours. The stitches should be removed at the end of a week. By this time the patient will be

able to walk about. He should wear a scrotal support for six weeks after operations for hydrocele or varicose veins. When the support fits too tight it sometimes causes persistent pain. After castration no active exercise should be undertaken in less than three or four weeks.

A complication that sometimes follows these operations is bleeding into the scrotum. This bleeding may be from a small vessel that was overlooked during the operation, or from a vessel that was pricked when placing the stitches. The difficulty of making any pressure on the scrotum and the looseness of the tissues allows of the accumulation of considerable blood in the sack. If the clots are not too large, they will absorb. Sometimes it will be best to open the wound and clean them out. Such a hæmatocele will protract convalescence a week or two. The patient will not be able to get about because of the soreness and tenderness, of the scrotum.

## CHAPTER XVII.

### THE NERVOUS AND VASCULAR SYSTEM.

**Brain.**—Practically all operations on the brain include incising the scalp and trephining the cranium. The cranial cavity has been drained through the nose after a puncture injury. If the dura is not injured the treatment will be the same as for other wounds (see page 142). If the dura is opened there will usually be some sort of drainage to prevent any accumulation of cerebro-spinal fluid. This drain should be removed on the second or third day. The stitches can be removed in five days or a week. The tissues heal rapidly and there is not much tendency to retraction.

After all operations that involve the opening of the cranium the patient should be kept from any mental exertion for a few days or a week. If the brain tissue is involved, mental exertion should be avoided as much as possible for from two or three weeks to several months. He should not be allowed to transact any business, and in severe cases he should not be allowed to even read letters.

His head should be raised on pillows, even immediately after the operation, if it does not increase the nausea. For a week or two he should be kept from any physical exertion. If he has to move about in the bed, he should have help. For operations that only involve the scalp and cranium, and in which there

is no brain lesion, the patient may be out of bed and on his feet at the end of one or two weeks. When the brain is involved the length of time that the patient should keep his bed will depend on the character of the brain lesion. When the wounds are healed and a little exertion does not disturb the mental functions he may get up.

These cases should be kept on liquid or soft diet (page 91) one or two weeks longer than other cases.

If a cerebral abscess has been opened, drainage should be continued until it is healed.

If paralysis precedes or follows the operation, especial attention should be given to the bladder that it does not become distended with residual urine. When the feces or urine are passed involuntarily, the greatest care will be needed to keep the patient from getting bed sores. The fracture bed is very convenient in caring for these helpless cases. See page 229.

**Spinal Cord.**—In discussing the cord we will consider traumatic injuries as though they were operations. As a rule spinal cord cases present the one problem of caring for the paralytic. Operations are made to relieve pressure paralysis. Injuries that we are interested in are those that result in pressure on the cord, either from a blood clot or a displaced or fractured bone. The operative treatment for such conditions belongs to other books to describe.

If the operation or accident destroys the cord, the patient will be a hopeless paralytic. If the bone, blood clot, tumor or other pressure has been removed by operation, paralysis may continue even though the cord is intact because of the inflammatory exudate

or serum that is thrown out in the spinal canal. When the paralysis is due to these causes, or even to a blood clot, there is hope that the clot or exudate will be absorbed and function restored.

In all these cases, the expulsive power of the bladder is lost; hence the need of passing the catheter, and if there is residual urine, seeing that the bladder is completely emptied once in six or eight hours. The urine dribbling away would indicate that the bladder is fully distended with residual urine. The injury to the nerves will prevent the patient experiencing any pressure or pain.

The sphincter ani will be paralyzed, and the stools will pass without the consciousness of the patient. With proper diet and care the stools may be kept solid; and, with sufficient watchfulness, the patient kept fairly clean. "Eternal vigilance" will be the price of keeping the patient from getting bed sores. In some cases the trophic nerves will be so injured, bed sores will develop in spite of any and all kinds of vigilance. Many times the bed sores are more distressing to the attendant than to the patient. He cannot feel them and, as a rule, cannot see them. For treatment of bed sores, see page 83.

If there is hope of the patient's recovery, especial effort should be taken to preserve the muscular tone and to keep up the general health. The first requisite, after caring for the dejecta, is a good, nutritious diet. As noted, it should be a diet that will keep the stools solid (page 94). Massage and electricity will be valuable aids. The massage should be given regularly and systematically, preferably by an expe-

rienced masseur. The treatments should be given once a day or once in two days. Faradism will help to exercise the muscles. The treatments may be given daily, each seance lasting ten or fifteen minutes. One sponge should be placed at the top of the spine, the other at the feet or along the paralyzed muscles. The current should be strong enough to cause a pretty sharp pricking sensation when applied to normal tissue.

#### HOMŒOPATHIC THERAPEUTICS.

I shall not attempt to enter into a discussion of the drugs that might be called for in these brain and spinal cord cases. I will simply suggest a few points regarding a few remedies.

*Belladonna* 3x.—This drug should be given on the usual indications: red face; throbbing carotids; muscular twitchings, even convulsions; throat dry and sore; pains sharp; pains in the head relieved by raising the head.

*Gelsemium*, 1 and 3x.—*Gelsemium* is a most valuable remedy for diseased conditions of the brain and nervous system. There is more of a besotted expression than with *Belladonna*; the nervousness and restlessness are less active, the pains more aching. *Gelsemium* has more numbness, and more influence over epileptic convulsions.

*Arnica*, 3x–30x, should be given for the bruising of the tissues, especially if the capillaries are injured and ecchymosis results.

*Rhus toxicodendron*, 3x, is to be given when there has been more of a straining of ligaments and fascia.

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It has done some wonderful things in spinal injuries. I know of two cases, in which complete paralysis of the lower extremities followed falls and injuries to the spine, that were cured by this drug. In both cases an interval of several months elapsed between the injury and treatment. No medicine had been given either case for some time prior to giving the *Rhus*, as they were considered hopeless. In the course of a few weeks both were able to walk, and eventually were entirely cured. One was an adult, the other a girl of seven or eight years.

*Apis mellifica*, 2x to 6x, and *Sulphur*, 3x and higher, have an influence on the exudate in the cord, causing its absorption.

**Nerves.**—After most operations on the nerves, the care will be simply that of the wound (page 142). After nerve splicing or suturing, whether done because the nerve had been ruptured by accident or been cut, the member will need to be kept quiet for a month or six weeks so that the new uniting tissue may become thoroughly organized. A splint may be needed. Massage and electricity should be used daily to keep the muscles in tone, so that when the nerve is regenerated they may again resume their functional activity. It may be weeks or months before this result is attained.

## THE VASCULAR SYSTEM.

**Heart.**—The after care of cases in which the heart is operated on is usually in the hands of the undertaker. Still, a few cases have survived suture of the heart muscle. After such operation the patient should

be kept perfectly still for a week, and should do nothing that would excite the heart's action for three or four weeks.

**Arteries.**—Operations for aneurism are frequently made. The after-care will depend on the importance of the vessel severed. If the artery is small and the anastomosing vessels sufficient, there may be but little disturbance in the tissues supplied by the diseased vessel. If, on the other hand, it is large and the anastomosing vessels small, as with the brachial or femoral, it may be several months before the collateral circulation will become sufficiently well established to give nutrition and strength to the limb.

Immediately after the operation the limb should be elevated and kept wrapped in warm cloths. Gentle massage should be practiced, care being taken not to disturb the aneurism. For a time the limb may be more or less œdematous. When the collateral circulation is established, which will be shown by improved nutrition and increased strength, the member may be used, increasing its work as strength returns.

**Veins.**—Operations for varicose veins do not disturb the circulation, at least harmfully, and after care will be little more than for an ordinary wound. Should the thrombus, by any mishap, become infected, the vein should be laid open and the clot turned out. The infection would manifest itself by increased swelling, redness and pain.

After operations for nevi, hæmorrhage may be an important complication. The wound should be opened and the vessel secured. One case for whom I removed a nevus, developed a new growth of vessels



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along the edge of the scar of the first operation. It was probably due to my failure to cut out all of the enlarged vessels. There was no recurrence after a second operation.

## CHAPTER XVIII.

### ORTHOPEDIC OPERATIONS.

It is not always easy to distinguish between what is operation and what is after-care in these orthopedic cases. In many instances the after-care may include treatments that are little less important or difficult than the original or first operation.

**Talipes** occurs in various forms. They may be congenital or acquired. The operations vary from a mere straightening of the foot and dressing it in fixed dressings, to extensive cutting of the soft parts and excision of bones. If cutting has been done, the first attention is given to the healing of the wounds. The foot may be held in the corrected position by the dressings. These dressings may be left on for a week if there are no untoward symptoms, as fever or increasing pain in the foot. It will be best to remove the dressing in three or four days, as a rule. Of course, until the flesh wounds are healed, the child will be kept off his feet. During this period a light plaster of Paris dressing over the gauze and cotton that are usually applied to wounds, will be found very satisfactory.

After the wound is healed the foot will be forced into as near a normal position as possible and held there by firm, retentive dressing. Plaster of Paris casts are most frequently used for this purpose. Plaster of Paris, if it is to make a firm dressing, must

be fresh or thoroughly dried, otherwise it will not set. If there is a question about it, the plaster may be put in an oven and baked for an hour. To prepare the plaster bandages a gauze bandage, about three inches wide and five or six yards long, is used. It is spread out and the plaster is sprinkled on freely. It is then rolled up loosely. It will take two or three rollers to properly bandage a foot, unless the child is very small. The foot should first be bandaged with rollers, preferably made from sheet wadding. The plaster bandages are soaked in warm water to which a little salt has been added. The water should cover the bandages. When no more air bubbles rise from the bandage it should be taken from the water and the excess of liquid squeezed out. It should now be put on rapidly and smoothly without reverses. The bandage should extend from the toes to the middle of the calf or higher. Most of the turns should be around the foot. The bandage may be strengthened by spreading some moistened plaster under the foot as the bandage is being applied.

The foot will have to be held in position while the plaster is setting. The cast should not be pinched while it is drying as any indentation is liable to cause a blister or a slough. The danger in using a plaster or gypsum bandage is that it may be too tight and cause gangrene. For a few hours the patient should be watched to see that the circulation keeps good in the toes. If there is any suspicion that the bandage is too tight, or if the foot is swelling, the cast should be cut open so as to relieve the pressure.

The child will walk about in these casts. They

can be worn two weeks, as a rule, before the sole will be so broken that a new cast will be needed. Every time a new cast is put on the foot should be brought into a more nearly normal position. A talipes shoe may be substituted for the cast as soon as the foot can be held easily in a good position. The treatment will often have to be continued for three years, or until the cramped and deformed bones have a chance to grow and fill out.

**Tuberculosis** of the *hip joint* occurs most frequently in children with a tubercular history. In the early stages the condition is rather one for medical and hygienic treatment than for operation. The treatment is described in all text-books on surgery.

When suppuration has taken place and the joint is much distended, or the joint has been destroyed and sinuses continue to discharge, an operation will be required to secure resolution.

If the operation is opening a synovial sac distended with pus the after-treatment will include local measures for the abscess, and constitutional remedies. For the treatment see page 53. There is one point that needs special mention: If the joint is not already ankylosed, traction should be made on the limb by means of Buck's extension. This will lessen the pain and inflammation by preventing the ends of the bones from rubbing together.

**Potts' disease** of the *spine* is another condition in which the treatment rather than the operation is the important part. Still, a patient is sometimes sent to a hospital where a plaster jacket is put on and then returns home to be cared for by the family physician.

For this reason I think a few words regarding the care of these patients will be in order, even though the conditions seem to have little reference to the operation.

Some anæmic children will not be able to wear a plaster jacket for any length of time. It may interfere with respiration or the weight, itself, may wear them out. With such a patient, as soon as a well fitting cast has become firm, it should be carefully cut down the middle of the anterior side and the edges sprung apart until it can be slipped off. It should then be sent to an instrument-maker that a leather or felt jacket may be made to take its place. This will be lighter, and will be so made that it can be laced. By this means the pressure can be somewhat regulated. The object of the jacket is to hold the weight of the upper part of the body from the diseased spine until the inflammation has subsided or the bones ankylosed. The jacket should be worn for two or three months after all soreness has subsided. This may be in from six months to two or three years.

If plaster jackets are depended on, they will need to be changed as often as they become broken so as to weaken their supporting power ; also if they begin to cause local irritations. The leather jackets will usually be worn until the patient has outgrown them. If a patient can wear the plaster jacket, it can be renewed oftener and is much less expensive than good leather or felt jackets.

The plaster bandages are made for the plaster jacket the same as for talipes (page 183), except that they

should be about an inch wider. The patient is prepared by putting on a smoothly fitting knit undershirt. A little cotton should be put over the points of the hips or other bony prominences, if the patient is poor. A towel should be folded and placed on the abdomen so it can be removed after the cast is on. This is the "dinner pad." Another folded towel should be put between the mammæ if they are large. When all is in readiness the patient is raised by means of a pulley attached to the ceiling or to the peak of a tripod. The rope is attached to the head by means of a harness that makes pressure under the chin and the occiput. The suspending apparatus also has supports for the arms. The extension should be sufficient to relieve the pressure on the diseased bones. It will be more in some cases than in others. Usually the toes should just touch the floor. The jacket should extend from a point about half way between the crests of the illia and the trochanters to the axillæ. In order to have the cast extend high enough over the chest and the shoulders, it will be necessary to make it higher in the axillæ than the patient can wear when the arms are at the sides. While the plaster is still soft it can be cut out under the arms with a sharp knife, so as to leave plenty of room and still without weakening the cast. It will require some experience in putting on plaster to know just how thick each individual cast should be made. If the patient is weak and anæmic, it should be made as light as will hold. If a bandage is put on so that the succeeding turns lap about half, three layers of the bandage may suffice. The number will depend largely

on the amount of plaster incorporated in the bandage. If the patient is strong and muscular, the bandage should be much thicker. The danger in his case will be in making it too light rather than too strong.

If there is a discharging sinus, a small cup should be placed over it and the bandage put around it so as to leave a fenestra when the cup is removed. The sinus can be treated through this opening without disturbing the rest of the cast. If *Peroxide of hydrogen* is used in treating the sinus, it should not be allowed to come in contact with the plaster as it will soften it. A coat of varnish about the opening will protect the plaster to some extent.

The hygienic and medicinal treatment in these cases will be just as important as the local measures. Along hygienic lines, the diet should have careful attention. Most of these cases will stand a little forced feeding. The regular meals should be nutritious and well cooked. It is generally considered that as much of beef or mutton fat, cream and butter should be taken as possible without hurting the digestion. A glass of milk or egg-nog, a dish of curds or custard, should be taken between meals and before going to sleep for the night. The fad now is, for tubercular patients to live as much as possible in the open air, especially in the sunshine. The results seem to promise much for these cases.

What has been said regarding the care of hip and back cases will apply to tubercular conditions in other joints.

## HOMŒOPATHIC THERAPEUTICS.

Whatever of hygienic measures are adopted, the internal remedy should be chosen with care and given persistently. If the case is suffering from septic infection due to the presence of pus germs in the sinuses, some one of the remedies discussed on pages 54 and 86 may be needed. In addition to these remedies, there is a group of drugs that have earned, through many years of use, an exalted position in homœopathic therapeutics in the treatment of scrofulous and tubercular conditions. In this group are the following :

*Calcarea carbonica* 6x-30x.—The general type of the *Calcarea carb.* patient is pale, fat, phlegmatic; head large, and sweats profusely; cold feet; afternoon diarrhœa.

*Calcarea phosphorica* 6x-30x.—This is a companion remedy to the former in these conditions. It follows *Calcarea carb.* when there is a little extension of the caries, sufficient to prevent the healing of the sinuses. I should give it when the disease of the bones overshadows the other symptoms.

*Silicea* 6x-30x should be given when there is a thin ichorous discharge from the sinuses; constipation from lack of expulsive power in the rectum—stools slip back after being partially expelled; stools clayey; foul sweating of the feet; general weakness and prostration.

*Sulphur* 12x-30x.—I feel that I have never learned how to get out of this remedy the good there is in it.



It has so many symptoms that are found in these conditions, that it is practically always "indicated." However, in my hands it has failed to come up to my expectations when given upon its symptomatology. An experienced and skillful physician once advised me to give *Sulphur* at the beginning of the treatment in all scrofulous cases. When no remedy seems clearly indicated, *Sulphur* will help clear the case. It is also useful when there seems to be no response to the indicated remedy. I would not have it understood that I use *Sulphur* only in the two ways emphasized. I simply wish to say, it is not a "cure all."

*Phosphorus* 30x has caries of bones. There seems to be general systemic, tubercular infection, with hacking cough. The type of the *Phosphorus* patient is the opposite of the *Calcarea carb.* patient. He is lean and neurotic, rather than fat and plegmatic.

*Phosphoric acid* 3x should be given in the more active cases. There is great debility with diarrhœa and night sweats.

## CHAPTER XIX.

### NECROSIS OF BONES.

After operations for necrosis, the wound may be closed or left open to heal by granulation, according to the condition of the patient or the method of the operator. If the wound is closed over a blood clot, bone chips, iodoform-plombirung or any other aseptic substance, the after-care will be simply to keep the wound aseptic until the parts are thoroughly healed. The difficulty of removing all of the diseased bone and making the wound perfectly aseptic leads to failure in securing this ideal healing in most cases. If there are active germs left in the wound, inflammation will develop and pus will form. When pus is present, the wound, as a rule, should be opened its entire length and the bone cavity cleaned out. It should then be treated as though it had been left open at the time of operation.

*Iodoform-plombirung* is a mixture of *Iodoform*, 60 parts; *Oil of Sesame* and *Cetaceum*, each 40 parts. Professor Moorhuf, of Vienna, devised the formula and uses it in his clinic. It will be noted that the substance has enough *Iodoform* in it to make it aseptic and antiseptic enough to keep bacteria from developing in it. If all of the diseased bone is removed, there will be no suppuration in and about the stuffing. If the soft tissues about an old sinus are of low vitality, as is often the case, infection may develop in

them without disturbing the bone cavity with its stuffing. Even if suppuration does not occur, a sinus will often develop in these cases, through which the softened wax, as a yellowish serum, will discharge as it is pushed out by the new bone granulations. This serum must not be mistaken for pus. If the parts are kept aseptic by occasional dressings (Moorhuf dressed such cases once a week) the bone cavity will gradually fill with new bone and the sinus close. If the sinus is not too large and the soft tissues about become vigorous and healthy, it may be dissected out and the wound closed. If a sinus opens and persists when there is no apparent reason for it, the cause will usually be found in some unremoved dead bone. In one such case the dead bone was found and removed, the cavity refilled with the stuffing, and the soft tissues closed over it. The wound healed by first intention and remained healed.

In making or using the mixture, it should not be heated over 120° F. to 130° F. The bleeding should be stopped and the cavity wiped dry before pouring in the melted wax. The wax should completely fill the bone cavity. It soon becomes semi-solid. Then the periosteum as far as possible and the soft tissues are sewed over it. If the cavity is large it will take a year for the bone to entirely replace the stuffing. As soon as the surface wound is thoroughly healed, and the bone is strong enough to support the patient, he can be up and about. In some cases so much of a bone may be destroyed that what is left would break if any weight was put on it. Such a patient should have the limb protected with proper splints, or should

use crutches until the new bone has developed sufficiently to support the weight of the body. The X-ray will show the proportion of wax and bone present.

If the wound is left to heal by granulation, it should be dressed as often as needed to make and keep it aseptic. This may be twice a day or once in three days. The dressing will include cleansing with *Peroxide of Hydrogen*, followed by *Saline* and packing with 5 per cent. iodoform gauze. If any portion of the bone about the cavity becomes carious or necrosed, it should be curetted out. Some cases will need several curettings before they get entirely well. These bone cases are often exceedingly slow in healing.

The internal remedies will be along the same lines as for tubercular joints, see page 189.

## CHAPTER XX.

### OPERATIONS ON JOINTS.

After-care of these cases will be different according to the joint treated, and the result sought. In this discussion excision or erasion of the joint, or any opening of a synovial cavity to remove diseased tissue, will be considered. The general principles of aseptic treatment should be observed in these cases with as much rigor as after abdominal operations. As the function and treatment of the various joints differs materially, it will be necessary to consider each joint separately. The object of the treatment will be to remove diseased and suppurating tissue, which is not only interfering with the function of the joint, but, through toxic absorption, is destroying the vitality of the patient.

**Hip Joint.**—After this joint is seemingly destroyed, the head of the femur removed and the acetabulum cleaned out, we may still get a new joint with fairly good function. The after-care will depend on the character of the operation. If there is no active supuration, and the wound can be closed for healing by first intention, the treatment will be much the same as for fracture of the femur. There is this difference, in fracture we seek to have the bones in close apposition. After excision the end of the femur should be kept a little separated from the ilium if we wish to get a new joint. I have used to immobilize such

cases a plaster cast, extending from the toes to the edge of the ribs. If properly applied, this cast will give sufficient traction to keep the bones in proper position, and will very thoroughly immobilize the limb. I operated on one lady of sixty-five who, as a result of fracture of the neck of the femur, had a flail joint that caused severe pain every time the limb was moved. She wore the cast ten weeks. It was a comfort to her. She could be moved about in the bed, thus changing her position often enough to prevent hypostatic congestion. The long side splint with Buck's extension is very satisfactory and much easier applied. The limb must be kept immobilized until the soft tissues are thoroughly healed: two or three weeks in the very robust; six to ten weeks in the anæmic, or those advanced in life. Of course, if bony union is sought, the immobilization should be kept up for two or three months. As soon as the soft parts are properly healed, passive exercise should be practiced, or the patient allowed to be up on crutches. Probably three months is as early as the most favored will be able to walk.

When the joint has suppurated and sinuses have already formed, more or less infection is pretty sure to follow the operation, and it may be weeks or months before the tissues are finally healed. Such cases will usually result in bony union. Sometimes, however, a surprising amount of motion will develop. If the sinuses do not extend to the end of the bone, passive motion should be used as soon as the tissues about the end of the femur are thoroughly healed. Until the sinuses are healed, they should be treated the same as such conditions in other parts (page 149).

**Knee Joint.**—In some simple operations, when the capsule and ligaments are but slightly damaged, an effort may be made to secure a movable joint. After extensive erosion or excision, ankylosis is the result sought. A weak, movable knee joint makes a nearly useless limb. A limb with an ankylosed knee may make a very strong and useful member.

If a movable joint is sought, passive motion should be practiced as soon as the soft parts are thoroughly healed. If the cartilages are destroyed, or the joint tissues much injured by suppuration, ankylosis will probably result, even though there is some motion just after the soft parts are healed.

If ankylosis is sought, the joint should be kept immobilized for three months. A plaster cast makes the best splint. When there are sinuses to be treated, fenestra may be made in the cast; or, if there is considerable discharge, the cast can be made in two parts, one above the knee, the other below. Over the knee steel hoops are placed. The ends should be bent and incorporated in the cast. There should be two or three of the hoops or bands, and they should be stiff enough to prevent any motion at the joint. With this sort of splint, the sinuses may be flushed and cleaned without soiling the cast. If the wound and sinuses are thoroughly healed, the patient may be allowed on crutches after four to eight weeks. When the complete cast has been removed, say, at the end of three months, a posterior knee splint should be worn for a month or two longer.

**Ankle Joint.**—This joint is frequently the seat of tubercular infection. The operation that will be

most frequently performed here is erasion or scraping out of the diseased tissues. Ankylosis is to be expected if the joints are involved. The after treatment will seek this end. Hence immobilization should be secured. A plaster cast is the most practical dressing. If sinuses exist, as they usually do, fenestra can be made in the casts so they can be treated (page 188). The time required to secure resolution will be measured by months rather than by weeks. The patient will not need to remain in bed during treatment. He should not walk on his foot until healing is complete, but it will be better for him to be about on crutches than to stay in bed.

**Shoulder Joint.**—The aim after operations on the shoulder will usually be to secure a movable joint. To attain this end, the wounds or sinuses should be healed as quickly as possible. The dressing during this part of the treatment will seek to immobilize the arm as well as can be done without interfering with the proper treatment of open wounds or sinuses. At the same time enough traction should be kept up to keep the bones a little separated. The retentive dressing should be about the same as that used for fracture. A moulded shoulder cap of plaster of Paris, felt or other suitable material, held in place by a spica bandage of the shoulder. A small pad may be needed in the axilla and the arm fixed to the side by a bandage around the chest. The weight of the arm will make sufficient traction, if the sling that supports the fore-arm is attached only to the wrist. It will seldom be necessary to use a traction weight at night. If there are open wounds or sinuses that have to be



treated, this dressing will have to be removed at each treatment. Of course this will make more or less movement at the joint. As we do not seek bony union, such movement will do no harm if care is taken that irritation of the tissues is not set up. As soon as the wounds are healed, passive motion should be begun, and active motion should not be very long delayed.

**Elbow Joint.**—The elbow resembles the knee in many respects, but to preserve its function an entirely different plan of post-operative treatment will be called for. In the knee, strength is of more importance than motion; in the elbow, motion is of equal if not more importance than strength. In clean cases it is possible to get good motion. When there has been suppuration in the joint, ankylosis or very slight motion will obtain. Bickham recommends a hinge splint, the ends of the bones being held about a half inch apart. At the first dressing the bones should be fixed at an angle of about 135 degrees. In a week or two, the angle can be changed toward a right angle, and passive motion begun. In the course of two or three weeks the splints can be discarded and the patient encouraged to use the arm. Sinuses should be treated the same as sinuses in other locations (page 149).

**Superior or Inferior Maxilla.**—The after-care of these cases pertains to feeding and to keeping the wound clean. The feeding will have to be done through a tube until the open wounds are well covered with granulations. The wounds on the face will usually be sutured and their care will be to see that

they do not become infected. The chief danger will be from the dressings becoming soiled. The wounds within the mouth will be left to heal by granulation. It will be necessary to spray the mouth several times a day at first, using *Peroxide* or *Boric acid solution*, or other non-poisonous antiseptic.

While many more excisions might be discussed, I think enough has been said on the subject to cover the points that will come up in the treatment of the other joints.

**General Notes.**—There are a few general points to be noted. First, the *Iodoform-plombirung* is especially applicable to the treatment of diseased bones in the joints. Moorhuf does not make excisions for disease of the articular ends of bones. He does an erosion, curetting out thoroughly all the diseased tissue. After drying the cavities in the bones, he fills them with *Iodoform* stuffing (page 191), and closes the capsule. As soon as the wounds are healed, the patients are allowed to walk about.

Second, when sinuses exist, there will often be some carious bone along their tracts. It may be due to some dead bone being left at the time of the operation, or to an extension of the caries after the operation. This dead bone can often be dissolved by irrigating the sinus with *Hydrochloric acid*. It should be used in the strength of dilute *Hydrochloric acid* and water, equal parts. A digestive ferment, consisting of *Hydrochloric acid*, ten drops; *Pepsin*, eight grains; water, one-fourth ounce, may also be used. The sinus can be filled with this preparation, letting the solution remain for half an hour.

## 200 BEFORE AND AFTER SURGICAL OPERATIONS.

Patients requiring joint operations are often anæmic from long continued septic absorption and pain, or from the tubercular diathesis which is responsible for the joint trouble. The general treatment of these patients is of prime importance. Whenever it is possible they should be kept in the open air. Their diet should be nutritious and easily digested (page 95).

The "old school" give tonics of *Iron*, *Hypophosphites*, or *Cod liver oil*. As a rule, the indicated homœopathic remedy will do the patient more good. If he does not respond to the attenuated drug, some one of the general tonics may be tried. Suggestions regarding the homœopathic drugs suitable for these cases are found in the list given for tubercular bone disease, page 189.

## CHAPTER XXI.

### AMPUTATIONS.

Amputations may be required after injuries and for diseased conditions of the extremities. These operations are often of the most serious character. The injury itself may have produced extreme shock. If the shock of the amputation be added, the most vigilant care will not always bring about a reaction. At other times the operation is made only after a long period of suppuration or devitalizing disease. Hence, it will often happen that when the patient is brought from the operation, the first attention will have to be given to the shock. The treatment for this condition is given on page 40. Here I wish to emphasize the importance of saline infusions (page 40). If the patient has come to the operation because of an accident, the chances are that he will have lost considerable blood prior to the amputation. In such cases no heart stimulant can take the place of added fluids to the circulation.

The comfort of the patient will usually lead to the proper position for the stump. The stump should be elevated, and probably flexed. This position will prevent congestion and will lessen the muscular contractions or spasms.

When the amputation is through healthy and sterile tissue, the chances of the wound healing by first intention are good. If conditions continue favorable,

the dressing need not be disturbed for ten days, or until the stitches are to be removed. The symptoms that would make it necessary to examine the stump would be increase in pulse and temperature after two or three days, or increase in soreness along the line of sutures. If the case was not aseptic, it should be dressed in two days. If there is any evidence of inflammation, the stitches in that part should be removed at once. Septic or suppurating foci should be opened promptly, so as to limit as much as possible the inflammation and formation of scar tissue. The usefulness of an artificial arm or leg will depend very largely on the shape and condition of the stump. Scar tissue sometimes spoils the shape of what would otherwise have been a good stump. Besides, scar tissue is often sensitive, and sometimes breaks down when irritated. If suppuration occurs, the usual treatment for abscess (page 53) will be called for.

*Secondary hæmorrhage* was the thing most feared by the surgeons in pre-antiseptic days. The prevention of suppuration, or its proper care when it does occur, has almost eliminated this trouble. Should secondary hæmorrhage occur, the proper course of treatment will be found described on page 84.

If an arm is the member removed, the patient will be allowed to get about on his feet as soon as his general strength will permit. If a leg has been amputated, he will be obliged to remain in bed until the parts are pretty thoroughly healed. The dependent position of the limb when the patient is up will lead to congestion that will cause pain and possibly interfere with the healing.

The old dictum was "save all the limb possible." Now the length of the stump is considered of less importance than its character. A good stump is one to which an artificial limb can be fitted. The directions for making proper stumps are discussed by all the writers on surgery. We will not take time to review that part of the subject. Our surgeons give practically no instruction about the care of the stump or the fitting it for an artificial member.

The stump should have the following conditions if the artificial limb is to be worn with comfort and be useful: The form should be oval, the skin smooth, the tissues over the end of the bone not too thick, and the tension of these tissues about the same or possibly a little less than the tension in the natural tissues of the part. The tissue over the bone should be freely movable. The scar, which is usually more sensitive than other tissue, should be small and so located that it will not be pressed on by the new member. There should be no tender points, as nerve filaments caught in the scar tissue or neuromata in the stump.

We might say that the converse of what makes a perfect stump would describe a poor stump. We will enter a little more into detail, that we may see how to avoid some of the difficulties and correct others. Much importance attaches to the shape. The most frequently ill-shaped is the conical stump. Assuming that the amputation was properly made, a conical stump might result from two accidental conditions. Suppuration and resulting scar tissue might spoil the shape of the limb. Undue atrophy of the muscles is

responsible for many of these cases. There is always more or less atrophy of the muscles after amputation. This comes about because of disturbance in the blood and nerve supply, and from lack of use of the muscles. If the patient is anæmic and the nutrition is bad, the injured limb will naturally suffer more than an uninjured part. In such cases the shape of the limb may be far from what is desired. Massage of the limb should keep up its nutrition during the trophic changes that take place in the stump and prevent, to some extent, the undue atrophy.

If in spite of care the bone presses against the tissue covering (conical stump), causing tenderness or pain, the end of the bone will have to be cut off to secure a better covering.

If the soft tissues are adherent to the end of the bone so that the sensitiveness prevents the wearing of an artificial member, an operation severing the scar adhesions, and in some instances cutting off the end of the bone, will be in order. If neuromata form in the scar tissue, they will have to be cut out.

The time that should intervene between the operation and the fitting of the artificial limb will differ in different cases. Probably no leg should be fitted in less than three months, and six months would be better for most cases. The limb should be fitted only after the shrinking of the stump, due to the atrophy of the muscles and subcutaneous tissues, has ceased. The healing should have been completed long enough so that the scar will be well organized and insensitive. Otherwise the artificial limb may produce irritation and pain, if not ulceration in the scar and

about the end of the bone. An artificial arm may be fitted a little earlier, or before the changes in the stump are as complete as will be necessary for an artificial leg.

Massage of the limb has already been spoken of as a means of preventing excessive atrophy. It seems to me that even the normal limb would be benefited, and the changes in the stump hastened by systematic massage. Gross recommends bandaging the stump tightly for some weeks before the new limb is fitted, that it may help in causing the shrinking of the tissue and shaping of the stump. Probably the bandaging would do some good if the pressure could be made just where the new limb would make pressure. If the skin of the stump is sensitive and tender, bathing the stump daily with cold water or *Alcohol* will improve the nutrition and toughen the skin.

We will not try to give directions for measurements or the selection of a limb. Each instrument house will have its own methods and styles. Catalogues should be secured, and from them can be selected the kind of limb best suited to the individual case.



## CHAPTER XXII.

### TRAUMATISMS.

**Contusions.**—In this chapter we will discuss the treatment after an injury the same as after an operation. Only injuries of the soft tissues will be considered. Amputations and fractures are discussed in another place.

Contusions vary in degree from a slight bruise to an injury that destroys the vitality of the part. It may include only the soft tissue, or both the soft tissues and bones.

For our convenience we will first consider bruises or contusions in which there is but little tearing or separation of tissues. The object of the treatment will be to keep the parts from becoming infected ; to lessen congestion ; to assist the absorbents, and to relieve pain.

The parts about the injury should be cleansed with an antiseptic. Should any bacteria get into the bruised and injured tissue, it will make a favorable soil for their development. There is not much danger of the germs passing through the unbroken skin, but after a severe contusion there are very sure to be breaks sufficiently large to allow the entrance of bacteria even though they are too small to be seen.

Elevation of the injured member, when it can be done, will help to prevent congestion. It will assist materially in relieving the pain, and will also assist

the absorbents. It will drain away the stagnant fluids from the part.

The application of heat will relieve the congestion, and also assist the absorbents. Heat is better than cold for such cases, as the cold might still further de-vitalize the already weakened tissues and cause a slough. A good way to apply the heat is to put on cloths wrung out of hot water, then put over them oil silk, oil cloth or paper to prevent evaporation. *Arnica* makes an excellent local application for bruised tissue. It should be added to the hot water with which the cloths are wet in the proportion of one part to four. *Hamamelis* may be used in the same way. I should use the *Arnica* if the circulation was sluggish with considerable ecchymosis; *Hamamelis*, when the capillaries are enlarged and the congestion marked.

In some instances a firm bandage will help to relieve the congestion and pain. It will keep the parts still by checking muscular contraction, and also promote the absorption of detritus and exudate. If a bandage is used, the patient should be watched to see that it does not become tight enough, through the swelling of the limb, to cut off the circulation. As a rule, a patient will be able to use the member as soon as the swelling and soreness have sufficiently subsided to allow its use without too much pain. An exception should be made if a joint is injured. After such an injury, the limb should be kept at rest until the soreness has all, or nearly all, subsided. If the injury is severe, passive motion should be practiced some time before active use is undertaken.

**Internal Injuries.**—When the trunk is the part contused, there is always the possibility that the patient has suffered internal injury. "Internal injury" has, in the past, been an indefinite something, that was always a sufficient reason for the patient dying. It should not be so regarded. It always represents a definite lesion. It may be a rupture of the intestine, leading to leakage of septic matter into the peritoneal cavity; it may be a rupture of the liver, leading to fatal hæmorrhage; or it may be any other organ within the trunk cavity that is contused or ruptured. If the symptoms indicate some hidden injury that threatens the life of the patient, an operation is called for. If the exact nature of the injury can be known with reasonable certainty, the proper treatment can be outlined. Many times the operation will be for diagnosis as well as treatment. Closing a leak in the bowel and cleaning out the peritoneum may prevent a fatal peritonitis. The prompt and proper treatment of a bleeding point may save a life. Of course, these operations belong to surgery, not the "after-cure." But it is the general practitioner's business to recognize the need and possibilities for relief for these cases, and not to sit back with folded hands and allow the patient to die because he has "internal injuries." The after-care of the operations for such cases is treated of in other chapters.

Shock often attends these traumatisms whether the parts are lacerated or only contused. Internal injury should not be mistaken for this condition. A few points of difference are these: The evidences of shock are immediate; of internal injury, delayed and of

slow and gradual development. The symptoms of shock will gradually grow less severe after reaction has once set in; the symptoms of internal injury will persistently increase. The two conditions may be present in the same case. If so, the condition of shock may be quite fully recovered from before the symptoms indicative of the internal lesion develop. The internal injury may be so severe that the case will go rapidly on to a fatal termination, without there being time for any reaction.

Shock and its treatment are fully discussed in chapter II.

If a contusion ruptures a *blood vessel* of any size, there will not only be extensive ecchymosis, but a blood tumor or hæmatocele will form. This will be recognized as a fluctuating enlargement. The blood will usually be absorbed in time if it does not become infected. In the later event an abscess will form that will have to be opened and treated the same as other abscesses. In some cases the blood will be in too large a quantity for the absorbents to take care of. Then it will have to be removed. If some days have elapsed between the injury and the opening of the tumor or blood cyst, the vessel will probably be sealed so there will be no bleeding from it. After the blood is evacuated the wound should be treated as a clean wound. The blood may escape into loose cellular tissue or a cavity. If so, the patient may lose enough blood to endanger life. The growing tumor should be laid open and the bleeding vessel secured. All of these operations or treatments should be done under the most careful asepsis.

**Hernia.**—A contusion may make a break in some confining membrane or tissues, as the fascia of muscles or the abdominal wall. If such structures are much injured, there may be a protrusion of muscle or abdominal contents, producing a hernia like mass under the skin. I treated one man who furnished a marked example of this kind of injury. He was struck violently in the right inguinal region by the end of a wagon tongue. The skin was not broken, but the fascia, muscles and peritoneum were extensively torn. After such accidents an incision should be made down to the torn tissue, and the rent sewed up. For the buried suture, I prefer chromacised catgut. In this class of injuries the tissues may be badly macerated and bruised. If so it may be best to defer any effort at repair until the absorbents have disposed of the devitalized tissue or a line of demarkation has formed between it and the healthy structures. If the injured tissue is trimmed away immediately, some might be removed that would regain its vitality if left. The more tissue that is sacrificed the larger the space to fill with granulations and the more cicatrix there will be to contract.

**Lacerations.**—When the skin is broken it adds greatly to the danger of infection. Like contusions, lacerations vary in degree from the slightest to the most serious injuries. In fact, in severe cases, the worst features of both conditions are usually combined.

The treatment depends on the degree and nature of the injury. When the skin is only slightly torn, even though there may be considerable contusion of

the tissues below, the treatment will be in the main the same as for contusions. In these cases especial care should be taken to make and keep the wound aseptic.

The severer traumatisms with lacerations present several important features for our consideration. Often the hæmorrhage will require the first attention. If the arteries are inaccessible, the hæmorrhage may be temporarily controlled by the use of a tourniquet, mass compression with gauze and a bandage, or by digital compression. If the shock is not too severe, the injured parts should be cared for at once. In some instances this care will mean an amputation. If amputation is not called for, the wounds should be made as nearly aseptic as possible by scrubbing and the use of antiseptics. All hæmorrhage should be stopped. The wounds should be enlarged, if necessary, so that the arteries can be ligated. If the physician is reasonably certain the wound is aseptic it may be closed. Healing by first intention can only be secured when the edges of the wound are not very badly contused. If any tendons or nerves are severed, their respective ends should be found and united with catgut or fine silk sutures. When the edges of the wound are ragged they should be trimmed, and then closely approximated by stitches or adhesive plaster. When the tissues are contused, but still have good vitality, drainage should be provided for. This drainage will consist of a few strands of cat-gut, a strip of *Iodoform* gauze, or a rubber tube, according to the needs of the case.

When the tissue is so pulpified that there will be

little or no chance of getting union by first intention, no attempt should be made to approximate the edges closely. The skin, which usually suffers less from the traumatism than the tissues beneath, might unite and prevent the escape of the fluids and broken down tissues that are always abundant in such cases. The wound may be lightly packed with gauze and the parts supported by adhesive plaster. These plasters should not seal the wound, but should be so placed as to counteract the tendency of the muscles and fascia to contract and separate its margins.

Sometimes the life is crushed out of the tissue, and portions of it will become gangrenous. When such a condition is imminent, extra pains should be taken to prevent sepsis. The care of the slough will depend largely on the general condition of the patient. If his condition is good, the local measures should consist in keeping the parts clean and aseptic until the line of demarkation is established. The slough can then be removed by cutting through the fascia. Granulations form so slowly in the fascia that it is not best to wait for this tissue to separate spontaneously. When the slough is large and foul, and the patient shows evidences of toxic absorption, the dead tissue should be cut away even though the line of demarkation has not formed. The risk of cutting into living tissue will be more than counterbalanced by getting rid of the sloughing mass and using antiseptics in the infected areas.

When the slough comes away it will leave a granulating sore. The principle of treatment for these sores is to keep them sterile and to stimulate a vigor-

ous granulation and cicatrization. The methods by which these principles are carried out are myriad. Some surgeons prefer dry or powder dressings. There are almost as many "best" powders as there are pharmacies. Some prefer moist dressings. The number of "best" in this line is not limited to the pharmacies, for nearly every doctor and every old lady, occupying the position of "neighborhood nurse," has some drug or mixture of drugs (generally mixture) that has "never failed to heal up old sores in the shortest possible time." Whatever other treatment is used, the parts should be kept clean and aseptic. This latter condition will not necessarily call for strong antiseptics. Strong antiseptics may do more harm to the granulations than could be offset by the destruction of germs in the wound. Sores in healthy people will heal in spite of germs. I know that a sore is sometimes prevented from healing by the effort that is made to kill every last bacterium and stop the discharge. *Calendula*, the non-alcoholic solution, in full strength, or diluted up to one part to four, stimulates a healthy granulation, and, in some instances, relieves the pain. *Calendula* is not an antiseptic. If there is pus in the wound it should be cleaned out with *Peroxide* and *Bichloride* 1 to 2,000 or 1 to 4,000, and there should be a moist 1 to 4 *Calendula* dressing applied. Unless these sores are small, a long time will be required for healing to be complete. Besides, the resulting scar will contract, causing at times unsightly deformities and even interfering with muscular function. If skin grafting can be done soon after the slough has separated, it will materially les-



sen the amount of contracting scar, and hasten the healing.

Another injury that simulates these severer traumatisms in the destruction of tissue is a *burn*. The standard treatment for superficial burns is to prick the blisters with an aseptic needle and let out the water, and to apply gauze wet with a saturated solution of *Bicarbonate of Soda*.

When the burn is deep enough to destroy the whole thickness of the cuticle or deeper tissues, the eschar will come away and leave an open sore. When the clothing, as well as the loose charred pieces of tissue, has been carefully removed, a dressing, wet in a *Boracic acid* or a *Normal salt solution*, should be put on. Some advocate keeping the dressing moist with the solution. This dressing should be left on for four or five days or a week unless there are some indications of septic absorption, or local conditions that would call for a change. Such local conditions would be secretions of pus, or sero-purulent matter in sufficient quantity to saturate the dressings. As much care should be taken in removing the dressing as in the first treatment.

When the eschar has come off, two courses of treatment are open. If the burn is small in extent, it may be left to heal by granulation. If the wound is large, or if the scar contracting would be unsightly or objectionable in other ways, skin grafting should be resorted to. This treatment should not be reserved for those cases only that cannot close up by scar tissue, but should be resorted to whenever the wound would be a long time in healing, or a better cosmetic or functional result could be secured by it.

**Skin Grafting.**—Skin grafting has been referred to repeatedly. A more minute discussion of the subject seems now to be in order. The conditions that call for this treatment follow accidents rather than operations. When the skin has been destroyed, new skin grows only from the margins of the wound. Each succeeding generation of cells seems to be weaker than the preceding, so that the farther the new skin grows the slower it grows until it stops or new skin ceases to form. The distance and rapidity that skin will form will depend on the general vigor of the epithelial cells. These will naturally be stronger in a healthy, vigorous constitution than in an anæmic person. So the distance that new skin will form from the margin of the wound varies. It may be from one to two or three inches. In large wounds skin grafting is necessary in order to have the wound heal. In smaller wounds, it greatly hastens the healing process. Another feature of importance is that there will be much less contracting scar tissue following successful skin grafting than if the wound or ulcer is allowed to fill in by granulations.

Thiersch's method is most used at present. By it the entire surface is covered with the grafts. The grafts are generally taken from a healthy surface on the patient, as an arm or thigh. Skin from the lower animals may be used. Frog skin is probably most frequently requisitioned for this purpose.

All of the surgeries discuss in detail the method of operation, so that ground will not be covered here. Most writers claim that the wound or ulcer should be made aseptic before grafting. An aseptic surface

would give better promise of success than a suppurating surface, but the grafting will not necessarily fail if there is pus in the ulcer. In fact, the treatment will sometimes check the suppuration. We had an excellent illustrative case in our hospital. Some time before entering she had been frightfully burned in a kerosene oil explosion. Her whole face, forearms, hands and fingers were scorched. On her face were places where the cuticle was destroyed, while her forearms and hands were nearly solid ulcers. The ulcers and the skin where burned, but not destroyed, oozed out an abundance of thick, greenish pus. A number of abscesses had formed in parts of the body that had not been burned. She was greatly emaciated and had all the symptoms of a mild septicæmia. Internal remedies and the most careful antiseptic dressings failed to materially check the suppuration. We finally decided to try skin grafting, hoping a few of the grafts would hold, and so improve the condition a little. Her own skin was too unhealthy to use. Frog skins were substituted. The ulcers on her arms were completely covered, using as large pieces as we could get from the bellies and legs of the frogs. The skins were taken from the frogs before the patient was anæsthetized, and kept in *Normal salt solution*. About two-thirds of the grafts took. Or rather the ulcers were reduced to one-third their former size. Even where the grafts failed to grow, the suppuration almost entirely ceased. The patient began immediately to improve in flesh and general vigor. Two subsequent attempts were required to completely cover the ulcers. Some colored frog skin was used, but the new skin was all of the same color.

## CHAPTER XXIII.

### FRACTURES.

Few surgical conditions have been more extensively discussed than fractures. In the text books on general surgery, in the monographs on fractures, the history and diagnosis of the various conditions are fully considered; the minutest details in reduction and setting, or first treatment, are given; but the directions given for the after-care of these important cases are exceedingly meager. When the dressings should be renewed, when the splints may be left off, when the member will be strong enough to be used; these, and many other points in the care of broken bones, should not be left to chance or instinct. The experience of the past in the treatment of these conditions should give us fairly accurate data as to what is best to do for each individual case or complication. Dr. Scudder's book on fractures is an exception to the general rule. In it the treatment includes not only the setting of the limb, but the care of the case until the patient is well and able to use the member. I have made use of Dr. Scudder's excellent work in preparing this chapter.

There are few if any general principles that apply in the treatment of these conditions. Each special fracture presents its own problem.

**Superior Maxilla.**—On the external surface this bone is covered by a very thin muscular layer, while

within the mouth, nose and antrum of Highmore there is scarcely more than a mucous lining. The position and shape of the bone would prevent it from fracture except by severe violence. As a result of these conditions a fracture of this bone is practically always compound. The break may be exposed to the air on both the external and internal surfaces.

After reduction feeding will be the first problem to be considered. For a week or more the food will be liquid and should be carried to the pharynx or œsophagus through a rubber tube. If a tooth is gone the tube may be readily passed through the opening to the throat. If the bone is badly broken, so that the act of swallowing is painful, feeding through the nose will be more comfortable to the patient. One end of the tube is passed through the nose into the œsophagus. To the other end is attached a funnel for receiving the food. If the mucous membrane of the nose is sensitive an application of 4 per cent. *Cocaine* on a pledget of cotton, or with a spray, will facilitate the passage of the tube. If there is a break in the mucous membrane of the mouth this method of feeding should be continued until it is healed. These bones unite rapidly, and in a week or two the patient will be able to take food that will require no mastication. In six or eight weeks, if there are no complications, the bones will be so thoroughly healed that ordinary foods may be masticated.

The next problem will be to keep the wounds in the soft tissues as aseptic as possible. To accomplish this, the mouth and nasal cavity should be cleansed and irrigated three or four times a day with *Boric acid*

solution or some other mild, non-poisonous antiseptic. Should infection occur and an abscess form, it should be opened and treated the same as abscesses in other parts. If the inflammation is in the antrum of Highmore, an opening may be made just above the second bicuspid. An incision should be made through the mucous membrane in the fold where the membrane is reflected from the jaw to the lip. The bone can be easily cut through with a small gouge. The cavity should be irrigated until the ulcerated tissues are entirely healed.

**Inferior Maxilla.**—What has been said regarding the superior maxilla applies, in nearly all the details, to this bone. With fractures of the inferior maxilla the taking of soft and solid food should be deferred a week or two longer.

One condition is liable to develop in this bone that seldom occurs in the other. The fragments are prone to become displaced. During the first week or two the jaw should be inspected daily and the pieces of bone readjusted if necessary.

**Ribs.**—There is very little to be done in the after-care of an uncomplicated fracture of the ribs. The bandage, whether of adhesive plaster or cloth, should be kept on for two or three weeks. If, after the removal of the bandage, breathing causes pain at the point of fracture, another bandage should be put on and left until the soreness has entirely disappeared.

The complications that would be most liable to cause anxiety or trouble are emphysema and pleurisy. The former needs no special treatment. If the pleurisy is due to a splinter of bone that continues to irritate

the pleural tissues, the fractured bone should be cut down on and the splinter removed. Of course, this work should be done only under the most careful antiseptic regime. Infection carried to the broken bone might cause, not only necrosis of the rib, but, serious empyema. Should the injured tissue become infected a free incision must be made down to the bone and the infected area thoroughly cleaned out and disinfected. Should the pleura become infected, a portion of the rib should be removed and the treatment followed as given for empyema (page 124).

**Sternum.**—After fracture of the sternum the patient will be obliged to stay in bed for three or four weeks. A half sitting position will be the best and most comfortable for him as a rule. He should wear the bandage a week or two after he is up and about. For some special cases Scudder recommends a "Taylor steel back-brace, with apron and head-support."

**Clavicle.**—There are several different methods of setting this bone. It would not be practical for us to give separately the care after each special kind of dressing. A few general, with possibly a few special directions, will give a good working basis. Whatever the dressing, the patient should be seen every day the first week, and as often as every other day the second week, to detect and correct any displacement of the fragments that may occur. Two or three readjustments and redressings will be necessary in most cases.

Some advocate passive motion of the shoulder in a week or ten days. I doubt the wisdom of such treatment. It is very difficult to keep the ends of the bone, in apposition. If the dressing is holding the

bone it should not be disturbed in order to move the joint. Unless the joint itself has been injured there will be no trouble in restoring its function after the clavicle is well united.

Should the fracture be compound, the usual care will be required to prevent its becoming infected. Should suppuration take place, free incision and cleaning out will be the treatment. An antiseptic dressing should be applied.

Non-union is rare in this bone. When it does occur, the ends should be exposed, cleaned or freshened, and any tissue that may be caught between them cut away. The pieces may then be fastened together with silver wire, chromacized catgut or kangaroo tendon, and the fracture dressing applied. *Chromacized gut* has been very satisfactory in my practice.

Another complication that rarely occurs, but needs attention when it does, is a misplacement of a splinter of bone so that the point projects toward the surface. A slight projection may be smoothed up by the callus filling out around it and leading to its partial absorption. If it makes much pressure on the soft tissues, it will lead to their absorption and exposure of the bone. These pieces of bone may be overlooked until after the swelling has subsided, and enough union established to prevent their replacement. In some cases it will be best to leave them until the bone is well united, when they may be exposed and snapped off. If the fragment is larger and threatens the vitality of the superimposed tissues, it will not be wise to wait for complete union, but the bone should be cut down upon and the projecting



portion pushed back into position, or the whole fragment removed. Except in a very nervous patient, *Cocaine* will be all the anæsthetic needed. The strictest asepsis should be preserved in these operations.

**Scapula.**—When the neck of this bone is broken, the after-care will be the same as for fracture of the upper portion of the humerus, which will be discussed in the next section. After fractures of other portions of the bone, the principal care will be to see that the fragments are kept in as good position as possible and that the tissue over prominent portions of the bone is not irritated by the pressure of the bandage. Daily inspection will be needed for a few days.

The bandage may be left off in four to six weeks.

Fracture of the ribs or injury to the thoracic viscera are complications that occur occasionally. Their care has already been considered in connection with fracture of the ribs.

**Humerus, Upper Portion.**—There are not so many things to do in the care of these cases, but the few are important to the securing of the best possible function of the joint. At the time the fracture is first reduced, the parts will probably be considerably swollen. As the swelling subsides, the bandages and splints will need tightening that there may be no movement of the broken ends. Daily inspection of the arm and an occasional redressing will be needed. Some surgeons advocate passive motion at the end of two weeks. I do not believe the general practitioner should start these movements so early. The surgeon whose fingers are educated to see the bones in their exact locations may be able to support the fragments

and avoid any accident in moving the arm while the union is so weak. To my mind, there is more danger of spoiling the result by bending the bones, or of increasing the callus by irritation, or of refracturing the weakly united ends, than in leaving the articular surface unmoved until the bone is quite firmly united.

If the case has done well, the splints may be removed at the end of four weeks and the arm carried in a sling. Binding the arm to the body, possibly with a pad in the axilla, for a week or two at night, after the splint is removed will prevent injuring the arm during sleep.

As a rule, the stiffness in the shoulder joint will disappear under passive and active motion. If some plastic arthritis has developed as a result of injury to the joint, and adhesions have formed that do not give way with such motion, it will be necessary to give an anæsthetic and break up the adhesions.

Full active motion for heavy work should not be attempted for eight to twelve weeks from the time of the fracture.

**Humerus, Shaft.**—The first attention that the arm will need in the after-care of these cases will be to see that the swelling after the splint is put on does not interfere with the circulation. If the splints are put on soon after the injury, there will be real danger of such an accident, and the splints may have to be loosened. The appearance of the fingers, if congested and especially if blue, and a persistent or increasing pain will indicate that the bandage is too tight. As the swelling subsides the bandages will fail to hold the bones in perfect immobilization, and will have to be tightened.

When the fracture is transverse, there will be little tendency to shortening. But if it is oblique, muscular contraction will cause the bones to slip by each other unless sufficient means are used to prevent it. The sling that supports the arm should be attached at the wrist, and not support the forearm. In ordinary cases the weight of the arm will make sufficient traction. It may be necessary in bad cases to have a weight hang from the elbow. This weight will be attached by adhesive straps the same as weights are attached to the leg. Only a small weight will be needed. Such cases, and some of those in which the weight of the arm is sufficient when the patient is on his feet, may require a special apparatus to hold the limb when the patient is recumbent. This will consist of a weight attached to the arm by a cord. The cord should pass over a pulley fastened at the side of the bed. The arm should be extended on a table or on a board of sufficient length. The board may lie on the bed beneath the sheet. Counter-extension can be secured by passing a bandage about the chest and fastening it to the bed rail on the side opposite the injury. All extension may be left off after two or three weeks.

Non-union or fibrous union are complications more often met in fracture of this bone than in any other. The usual methods of treating non-union may be tried here. Rubbing the fractured ends together will stimulate enough activity in some cases to cause a callus to form and a bony union to result. In some instances, the bone should be exposed and the fractured surfaces freshened and fastened together with

silver wire or chromacized gut. In these cases the general health of the patient should be carefully looked after. Low cell vitality from anæmia, syphilis or other constitutional diseases may be responsible for the non-union. For therapeutics, see the close of this section.

An injury of the musculo-spiral nerve by the traumatism or by inclusion in the callus is a common accident in fracture of the humeral shaft. If the nerve is pressed upon by the callus, or merely injured, but not destroyed, severe neuralgic pains in its distribution to the back of the forearm and hand will be present. If the continuity of the nerve is destroyed, there will be complete paralysis of the extensor muscles of the wrist, hand and fingers except the last two joints. The treatment for this condition is to expose the nerve and determine the extent and character of the injury. The nerve can be located by finding it above or below the injury where the tissues retain their normal relations, and tracing it into the region of the fracture. If the nerve is broken, the ends should be found and sutured, if they can be brought together. Function has sometimes been restored when the nerve had been severed a year or more. For other operations on nerves, and for particulars, consult books on general surgery. If the nerve is simply pressed by a callus, but not destroyed, it can sometimes be dissected free, and relief from pain and recovery of function secured. None of these operations should be made in less than four or five months after the injury, unless the indications that the nerve is divided are positive. The symptoms pointing to

such complication are complete and constant paralysis of all tissue supplied by the nerve from the time of the injury. A contused nerve may recover a healthy condition and function after months of paralysis or irritation. Besides, by waiting this long, the bones and tissues about the injury will have recovered vigorous vitality.

The arm should be kept in the splints for four or five weeks. Then a sling may be substituted. This should be worn much longer. Twelve or fourteen weeks will elapse before the arm will be strong enough for any but the lightest work.

**Elbow.**—Under this head we will consider fractures that occur in any bones near this joint. Retaining or restoring the function of the joint is the important thing in the after care of all of these cases.

It is safe to treat them all as though they might result in restricted motion or complete ankylosis of the joint. It will be impossible to tell in any particular case whether the joint is injured or a dyscrasia is present that would lead to a destructive arthritis. Some surgeons are advocating the setting of most of these fractures in complete extension as giving a better opportunity to reduce the break and immobilize the pieces. Fracture of the olecranon is nearly always set in extension.

Whatever the method of setting, the first consideration will be in these, as in most other fractures, to see that the dressing does not constrict the swelling arm. When the swelling begins to subside almost as careful watching will be required to see that the dressings do not become too loose. The bandages may need several readjustments during the first ten days.

Union will be firm enough in four to six weeks to allow of passive motion. If the tenderness has left the joint so that passive motion can be practiced without causing pain, or soreness that lasts over half an hour or an hour, the splints should be removed each day and the arm given the exercise. At first the movement should be through a very small angle, increasing each day as the joint will stand it. In this way the arm that is set in extension can be brought up to a right angle and the arm set at an acute angle can be straightened out. In some instances it may be best to postpone all movements until the bone is quite firmly united and then, under an anæsthetic, break up all adhesions and dress the arm at a little less than a right angle. The soreness from this rough treatment will subside in a few days, after which passive and mild active movement may be practiced. Do not allow the arm to become ankylosed at an angle greater or much less than ninety degrees. If passive motion will not bring it to a proper position, do not hesitate to correct it under an anæsthetic. If an arm is going to be stiff or nearly so by all means have it in a position that will make it most useful to the patient.

In eight or ten weeks the bone will be firmly enough united to allow quite vigorous active motion. The active use of the arm will accomplish more in restoring the function of the joint than any amount of passive motion by the physician or nurse.

If the position of the fragments or an excessive callus prevents the arm being put in a position that will give a useful member an excision of the joint will be needed. For the after treatment of this operation see page 198.

**Forearm.**—The daily inspection to guard against constricting blood-vessels, or a too loose dressing, is important in fracture of the shaft of the ulna and radius, either or both.

Firm union practically always results in these bones, and about the only complication is the loss of the power of pronation and supination. Assuming that the bones were properly set, this loss of function will result from a bridge of callus or bone between the radius and ulna. Passive motion should be begun in four to six weeks. By supporting the fragments it may be possible to stretch the adhesions before they become too firm and thus secure some restoration of function. If ankylosis is going to result the hand should be kept half way between pronation and supination, as this position gives the most useful member.

After three or four weeks, the anterior splint may be left off. The posterior splint should be retained for a month longer. Some surgeons advocate the use of only a sling after six weeks. I can see no advantage in it and the arm is certainly more apt to become bent if the board is left off before the union is firm. In from eight to twelve weeks the arm will be strong enough for active use.

**Wrist and Hand.**—There may be considerable swelling in these injuries so that the dressing may require readjusting, but it will often happen that the first dressing can remain until the swelling has subsided. Then it should be removed to see that the bones are in proper position. Passive motion may usually be begun at the end of two weeks. In five to eight weeks, active use of the hand may be resumed.

In young, vigorous subjects, good union and function will usually be secured. These injuries frequently occur in elderly people. In them they are liable to develop considerable œdema, as well as some plastic synovitis and periarthrititis with adhesive inflammation between the tendons about the wrist joint. In such cases it will be necessary to remove the dressing frequently, that the limb may be massaged and passive motion instituted. In spite of the best of care there will usually be considerable stiffness and disability when the bones are firmly enough united for the patient to resume active use of the hand. Much of this stiffness will wear away, but in old and enfeebled people some permanent disability may be expected.

**Pelvis.**—Fractures of the pelvic bones are among the most serious, because they are so frequently complicated by laceration of important pelvic viscera. In the after care of any fracture that destroys the continuity of the pelvic ring, a Bradford frame or a specially constructed bed will be found almost a necessity. With some special means for handling the patient, it will be possible to attend to the bowel evacuations or change the bedding without disturbing the broken bones. The Bradford frame meets the needs very well. As described, it consists of a frame of gas pipe made a little longer and a little wider than the patient. Over this frame is fastened a piece of stout factory. An opening is left under the buttocks large enough for the stools and urine to be cared for without soiling the cover. This covered frame is to lie on the bed and the patient is to lie on it with-



out intervening sheet or bedding. This seems a simple point to mention, but I have seen the frame made ready and a sheet put over it, the attendant thinking that the patient must have a sheet next to him. When it is necessary to attend to the patient, the frame can be lifted free from the bed so that a bedpan can be used or the bedding arranged. One nurse can care for a good sized patient, as the frame can be raised a corner at a time and propped up with books or blocks. It is obvious that the gas piping should be strong enough to bear the weight of the patient without much bending.

If a plumber and gas pipe cannot be secured readily, a good frame, and one that will answer the purposes very well, can be made by using lumber in place of the pipe. I have used two-by-four inch pine pieces for an adult. Smaller timber may be used for a child. The ends can be fastened together with nails, or better with small bolts. The cloth can be fastened to the frame with large tacks. This is somewhat more cumbersome than a Bradford frame, but its cheapness, and the ease with which it can be made, will make it preferable in many cases.

Uncomplicated cases will need to keep their bandage on for six weeks. In twelve weeks they may be up and about.

Any operation that would be needed because of laceration of the bladder, urethra or other viscera should be made as a part of the first treatment of the case. The care of such operation will depend on the organ or viscera injured, and is discussed in connection with operations on the separate viscera.

**Femur, Upper End.**—The treatment of these fractures will depend on whether the patient is young and vigorous, or old and decrepit. "In the case of a fracture of the neck of the thigh-bone occurring in an elderly individual, treat the patient and let the fracture be of almost secondary importance" (SCUDDER), is a sentiment with which most surgeons accord. If an immobilizing apparatus is put on, the patient should be carefully watched, and if hypostatic congestion of the lungs or other parts occur; if uncontrollable bed-sores develop; or if the patient is simply growing weaker, thus showing that she is not able to endure the protracted confinement, the splints should be taken off, the position of the patient shifted and she be made as comfortable as possible. Sand bags placed along the limb will steady it. A partially useful limb and a live patient are far more desirable than a partially united bone and a dead patient.

Even along these lines the physician will need to use keen judgment. The error of allowing a patient, who might recover with a useful limb if proper care and persistence were used, to shift along and get up with a shortened, deformed and cumbersome member will be almost as bad as to kill the patient with too much care. These old people are apt to feel that the broken limb is the last drop in their bucket of woe and their only desire is to be made as comfortable as possible. The future seems to have little in store for them and they are not willing to endure present restraint and suffering for the little additional comfort that it might bring to them. They should be encouraged, cajoled, if necessary. The surroundings

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should be the pleasantest possible, and only optimistic friends should be allowed to sit with them. The diet should be nutritious, easily digested, and, possibly, stimulating. Massage will help to keep up the general vitality, and the properly selected remedy will help to remove any dyscrasia that might interfere with the healing or tend to weaken such patients. Do not be in a hurry to give up the possibility of a fairly good limb for a certainty of a bad one.

In any fracture of the leg the Bradford frame will be found an invaluable help in the care of the patient (page 229).

We will first consider the care of cases that are not suitable for immobilization. If the patient can stand some traction a weight of five or six pounds attached to the leg with adhesive straps, after Buck's plan, will prevent much shortening and greatly improve the chances for a useful limb. In addition to the traction, sand bags should be placed along the sides of the leg, and possibly of the body, to steady the parts and prevent much motion. These bags should be adjusted so as to secure the greatest amount of comfort to the patient. At the end of a week or ten days the patient may be bolstered up into a half sitting posture. At the end of three weeks the weight may be removed from the limb and a little more latitude allowed in the matter of sitting up. In eight or ten weeks the patient may be allowed to get about on crutches, but no attempt should be made to bear weight on the foot under twelve or sixteen weeks. Such patients can consider themselves fortunate if they are able to bear much weight on the limb in a year.

If the patient cannot stand the traction weight, the routine will be about the same as that described in the previous paragraph, except that progress will be slower and the results not so good.

If the patient can endure more rational treatment, Buck's extension side splint will be most frequently used. It should be worn for three or four weeks. By that time the extension will be no longer needed and a Thomas splint (see text books on surgery) or a plaster of Paris splint may be substituted. The Thomas splint seems in more favor. The advantage in this splint is that the limb can be inspected and receive massage treatment without its removal. While this splint is worn the nurse should see that no pressure sores develop. Every day or two the skin, wherever there is any pressure, should be slipped a little to one side under the bar so as to bring the pressure on a new surface. A patient with this splint can be allowed up on crutches. A lift of an inch should be put on the shoe that is worn on the well leg, so as to keep the injured limb free from the floor.

After eight weeks a little weight may be put upon the injured limb. The limb will continue to increase in strength for several months. Many patients will have to use a crutch or a cane.

In case of non-union every movement of the limb may be painful. Such cases may occasionally be benefited by operation (see page 195).

**Femur, Shaft.**—In this fracture there is danger of the limb swelling after the dressing is put on, thus cutting off the blood supply and causing gangrene. It is also one in which the bones could be easily dis-

placed if the dressing should become loose. Hence, the need of careful daily inspections. The coapting splints should be changed as often as necessary to keep the right pressure. Another reason for frequent inspection is the tendency to shortening. The limb should be measured every day or two until the bones are firmly enough united to insure against slipping. This will be in three or four weeks. The shortening of the limb while under treatment would indicate that the weight was not heavy enough. However, the apparatus should be carefully inspected. The pieces of wood that separate the adhesive plasters at the foot may press on the cross piece. Again, a child, and sometimes a simple minded adult, who cares more for present comfort than future good, will slip down in bed or get in some position that prevents the weight pulling on the leg. People who would be guilty of such carelessness are among the first to blame the doctor if the results are not perfect.

The weight may be lessened after two or three weeks, and left off entirely after four or five weeks. The splints that prevent bending or twisting of the leg should be retained for four weeks longer. Surgeons who are skillful in the use of plaster of Paris may be able to put on a plaster splint, after the traction is no longer needed, that will allow the patient more freedom and be more comfortable than the ordinary splints. The ordinary physician will do better to leave well enough alone and continue the splints that held the limb in proper position during its more critical treatment. After eight weeks, all splints may be left off while the patient remains in bed. After a

week in bed without a splint, the patient may be allowed to get up on crutches. Coaptation splints should be worn for three or four weeks longer, and the shoe on the uninjured foot should have a lift of two inches, so as to prevent the patient from bearing any weight on the injured limb. In twelve to sixteen weeks the patient may bear his weight on the leg, but he may be obliged to use a crutch or a cane for several months longer. In very young children, the stages of treatment may be shortened two or three weeks.

Two points of pressure, the sacrum and the heel, will need watching, and may need ring pads ("doughnut shaped") to keep them from getting sore. These pads may be rubber air bags, or made of cloth filled with cotton.

Fracture of the long bones is sometimes the cause of a fat embolus. This complication occurs more frequently in fracture of the femur than in fracture of any other bone. The symptoms of this condition do not usually show themselves under twenty-four hours after the injury. The oil globules of the injured bone marrow are carried to the lungs and plug the capillaries. If in sufficient numbers, they will interfere with the breathing. This interference may be simply an embarrassment, or it may be so extensive as to cause death. Sometimes the symptoms resemble those of shock. They would be distinguished from this condition by the interval of reaction. The condition would be distinguished from hæmorrhage by the physical signs in the lungs, and by finding oil globules in the urine. The treatment is to stimulate

the heart so that the blood pressure may force the globules through the capillaries of the lungs.

**Knee.**—The same principles will guide in the after-care of fractures about the knee, whether in the femur, tibia or patella. The object of treatment here is to get a strong limb with as much motion as can be secured without detracting from the strength. At the elbow, we wanted a movable joint with as much strength as could be secured without interfering too much with the movement. In other words, we sacrifice strength to motion in the elbow; but motion to strength, in the knee.

Fractures of the femur or tibia that do not affect the joint will require the same care as fractures of the shafts of these bones. When the joint is involved, the infusion of blood and serum will fill the synovial sac and may cause serious distention. In such cases, and in fact in most of the cases in the class that we are now studying, the first dressing will be only temporary, the permanent dressing being put on only after the swelling has subsided. So, the after-care will comprise pretty much the whole treatment of the case.

The first attention should be given to the swelling. If there is not much effusion in the joint the limb should be firmly bandaged at once. The bandage should extend from the toes to the groin. The toes should be left uncovered as they will show the condition of the circulation. Before the bandage is put on, the knee should be surrounded by a thick layer of cotton. This will give some elasticity and protect the blood-vessels should there be some increase in the

swelling after the bandaging. A rubber bandage could be used with advantage about the knee. A bandage of this kind should not be put on until the limb has stopped swelling unless there is some one to watch the case who would know if the circulation was being interfered with. In addition to the bandage, hot fomentations, or a hot water bag applied to the injured part, will ease the pain and help the absorbents. Moist heat is usually more effective than dry.

When the synovial sac is much distended, the fluid should be drawn off. The skin should be thoroughly sterilized and the instrument perfectly aseptic before aspirating the joint. Within the joint are the most favorable conditions for the development of bacteria should any gain entrance. But for the danger of infection, the joint should be aspirated whenever there is perceptible effusion, as, by this method, the injured parts would be cured in less time and, as a rule, with better function. With this danger present, cases are only aspirated when the risk from the fluid is greater than from the chance of infection. When the fluid has been drawn off, the bandage and pressure should be used as previously described.

As soon as the swelling has subsided the limb should be put in some form of immobilizing splint, preferably a plaster cast. For method of putting on a plaster cast see page 184. Should the patient complain of pain, or there be any evidence that the circulation is disturbed, the cast should be split open, and possibly removed. Experienced surgeons have ruined limbs by not exercising proper precautions in the use



of plaster casts. It takes but few a hours to produce pressure gangrene if the cast is too tight.

The cast should be removed at the end of the first week that the limb may be thoroughly inspected and any deformities corrected. If the limb is in good shape, with no tendency to displacement of the fragments, the next cast may be left on for three weeks. It should then be removed and a posterior moulded splint substituted for it. This will allow of passive motion to the joint and massage to the limb. The moulded splint can be made by taking a gauze bandage as wide as one-third the circumference of the limb. The splint should extend from the ball of the foot to the upper portion of the thigh. The bandage is then unrolled on a table the length necessary for the cast. Plaster of Paris is sprinkled on the gauze. Another layer of the bandage is then unrolled on the first and some more plaster put on. This process is repeated until six or eight layers of the gauze have been filled with the plaster. The whole is then to be rolled up loosely as a single layer. When soaked in warm water with a little salt in it, it is to be applied to the limb lengthwise, beginning at the foot. As fast as the plaster is unrolled, an ordinary roller bandage should be put on to hold it and to mould it to the limb. When the plaster is hard a perfectly formed splint will result. The limb should be covered with a cloth or cotton bandage before the plaster splint is put on.

The patient can begin to use the limb in eight to twelve weeks. In many cases it will be necessary to wear an elastic or gauze bandage over the knee. In

some cases the knee will have to be supported by a posterior splint.

**Shaft of the Tibia and Fibula.**—One or both bones may be broken and the fracture compound. This is another condition in which it is difficult to distinguish between what would belong to the first treatment and to the after-care. The leg is usually put up in temporary dressing until the swelling subsides. If the fracture is compound the important thing in the care of the case will be to secure asepsis in the wound and maintain it until it is healed. This will be secured by the use of aseptic and antiseptic methods in treating and dressing. As soon as the swelling is subsided a plaster splint should be put on. If the fracture wound is still open a fenestra should be made in the cast either by putting a cup over the wound or by cutting an opening before the plaster is hard. The patient can begin to use the limb in ten to twelve weeks. All supports may be left off after the limb has been walked on for two weeks.

Ambulatory treatment of fractures, especially of the shaft of the leg, has been advocated by some surgeons. The treatment is still confined to hospital practice, where the patient can be kept under constant observation. Even here it has not been generally adopted. By this method of treatment the patient is allowed on his feet almost immediately after the splint is put on. While the extreme idea is not practical for the general practitioner, combining this idea with the "non-use" method, and thus getting the patient on his feet and using the limb three or four weeks earlier than by the old method, is practical. It will

take the bones four or five weeks to unite. At the end of this time the ambulatory cast may be put on. First a cloth roller bandage is to be applied from the toes to the perineum. On the sole of the foot a layer of cotton two inches thick is to be placed. The plaster cast should extend from the toes to the thigh. It will need to be made stronger about the foot so it can sustain the weight of the body. The cotton will make a cushion that will keep pressure off the foot. The weight in this case will be sustained by the knee and thigh. Patients who stand confinement badly will experience marked relief by this kind of an apparatus.

**Ankle.**—The most common fracture in this part of the leg is Pott's. Plaster of Paris will make the permanent dressing. Before it is put on, however, the temporary splints may need to be adjusted several times to meet the changes in the swelling of the foot. Two points especially will need watching. There is a strong tendency of the foot to become dislocated backward, and a carefully adjusted moulded splint may be needed to hold it in place. If it cannot be held without, the tendo-Achilles should be cut. The other danger is that the foot will become abducted. As soon as the swelling has abated and the foot is in good position the plaster cast should be put on. This will usually be at the end of the first week. The patient can then be allowed to get about on crutches. At the end of three or four weeks the foot should have massage and some passive motion. To secure this the cast should be cut so it can be taken off. After the treatment it can be readjusted and held in

place with a bandage. Active use of the limb may be begun in eight to ten weeks. Scudder recommends the wearing of an artificial arch or pad under the foot for six months.

## NOTES.

**Massage** in the treatment of fractures has a universally recognized value. It improves the nutrition of the part and hastens to some extent the uniting of the bones. It might also prevent non-union when the system was only just able to make the repair. In healthy subjects the bones may be ready for active use a week or two earlier if the patient has intelligent and proper massage. His muscles would recover their tone and strength much quicker than without such treatment. To get good results the treatments should be given only by someone who understands the business. This might add a considerable sum to the cost for the care of the patient. Besides, the loosening of the bandages or splints before the bones are firmly united, so the masseur can get at the limb, is not without its dangers. I knew a fractured femur to be considerably bent and irritated because of an improper adjustment of the splints after a massage treatment.

These things are mentioned here because some writers put so much emphasis on the importance of massage as to lead one to think they regarded it essential to a cure. Before there is firm bony union, massage should only be practiced by a competent

masseur, and the bandages should be re-adjusted by the surgeon. This will require extra attention from the surgeon. The massage treatment would be beneficial to the healthy patient, and, if he could afford the extra expense, should be given. If union is not progressing satisfactorily, or if the patient is weakly or anæmic, he should have massage if it can be secured. In such a case, general, as well as local massage would be beneficial.

**Non-union.**—This subject needs a little special attention. The causes of this condition are failure to immobilize the bones; portions of the fascia or muscles getting in between the fractured ends; constitutional conditions as syphilis, tuberculosis and diseases or tumors of the bones.

In non-union there may be a flail joint, in which case there has been little or no attempt at union; cartilaginous union, when the bones are held together by cartilage, but there is wanting the stiffness necessary for good function, and false joint. There may develop in this last condition a new articulation and synovial membrane.

In treating a case of non-union, the cause should be sought. If there is any dyscrasia, the proper drug should be given. If the bones have not been thoroughly immobilized, they should be more carefully fixed. If these measures fail, the ends of the bones should be rubbed together to irritate them and also to work out any fragment of fascia that might prevent their union. Should the bones still fail to unite, the break should be exposed and any callus or intervening tissue removed and the ends of the bone freshened

and united with wire or slowly absorbing gut. In rare cases it may be necessary to amputate a member.

## HOMŒOPATHIC THERAPEUTICS.

The results of a fracture and its treatment are often similar to a severe operation. Shock, hæmorrhage, or any of the general conditions that follow operation or anæsthetic may be present. The drugs for such conditions have been discussed and should be studied under their respective heads. In this section we will consider the drugs that may be called for because of the local condition.

*Arnica montana* 3x.—This remedy has a well earned reputation in our school, in the treatment of bruised and contused tissue. Fractures certainly come in this class. Prof. Helmuth recommends that a dose of this remedy be given at the beginning of treatment in every case of fracture.

*Belladonna* 3x should be given when there is marked congestion and swelling about the injured part. The skin is red and there is apt to be more or less throbbing pain. Besides these local symptoms, there may be a rapid, bounding pulse with some fever. The patient may have some headache, worse from having the head low; he may be sleepy but is unable to get to sleep.

*Gelsemium* 1x or 3x.—General relaxation is the characteristic of *Gelsemium*. There is congestion, but it lacks the sthenic character of *Belladonna*. The patient is restless and neurasthenic; passes large

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quantities of urine; cannot sleep; has headache, especially occipital; is dizzy.

*Nux vomica* 3x.—The sudden change from an active to an inactive life frequently results in the whole system becoming "clogged." The tongue becomes coated; digestion slow, with some fermentation showing itself in distress half an hour to an hour after meals; bowels are constipated.

*Mercurius* 3x.—This remedy is also given because of the conditions resulting from this change in activity. The coating on the tongue is more pasty; the stomach symptoms may be less marked, and there is apt to be some jaundice; the stools may be diarrhœic or constipated. If constipated they will be more or less clay-colored. The patient sweats profusely, especially at night (I have usually given *Mercurius corr.* 3x for these night sweats); all the symptoms are aggravated at night.

*Calcarea phos.* 3x or high seems to have the faculty of promoting the formation of callus. It should be given in cases that unite slowly or that result in non-union. The typical *Calcarea phos.* patient is one in which the bones are slow in developing; the fontanels are slow in closing; there is pain along the cranial sutures and in the symphyses; there may be cough or other signs of the tubercular diathesis.

*Symphytum* is recommended for non-union, especially where there is an irritability at the ends of the bones.

*Ruta* is given (Helmuth) to hasten the deposit of bone in the callus.

*Apis mellifica* 3x is useful if cellulitis or œdema are present.

*Calcarea carbonica* 3x or 30x should be given when repair is slow because of general anæmia. The patient may be fat enough, but he lacks hæmoglobin. It acts on the general vegetative system and especially upon the bones. It is indicated in conditions that lead or predispose to fracture.

*Silicea* 3x or high is another constitutional remedy. It has more of the nervous element than *Calcarea carbonica*, and the perspiration is apt to be more profuse and offensive, especially in the feet. There is excoriation between the toes. But the condition for which it is the most useful in our present study is for the thin, excoriating discharge following compound fracture or other infected bone injury.

*Calcarea fluorica* 6x and *Fluoric acid* are two remedies that are indicated when the bones seem to need increased nutrition; when there is tendency to necrosis with excoriating discharge.

*Aurum* 12x.—When non-union or slow union is due to syphilitic taint remedies that have a specific action on this condition should be studied. *Aurum* would be especially indicated when the nasal bones are broken, because of its special action on these bones, in which it produces caries with an offensive discharge.

*Mezereum* and *Stillingia* are syphilitic remedies that affect the bones. The action is on the long bones, in which they produce severe pain. The *Mezereum* pain is more distinctly worse at night, and the parts are more sensitive to touch.



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*Kali iodatum*.—This remedy has “gnawing bone pains, throbbing and burning in the nasal and frontal bones.” It is the nearest to a specific for tertiary syphilis of any known remedy. It should be given when non-union results from this disease. The best results are usually obtained by giving it in material doses.

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